DOCUMENT RESUME

ED 425 040 RC 021 739

AUTHOR	Abbott, Eric A., Ed.
TITLE	Making Wise Choices: Telecommunications for Rural Community Viability. Proceedings of a Workshop (Kansas City, Missouri, February 25-27, 1997).
INSTITUTION	North Central Regional Center for Rural Development, Ames, IA.
SPONS AGENCY	Farm Foundation, Oak Brook, IL.; Iowa State Univ. of Science and Technology, Ames.
PUB DATE	1997-02-00
NOTE	85p.
PUB TYPE	Collected Works - Proceedings (021)
EDRS PRICE	MF01/PC04 Plus Postage.
DESCRIPTORS	Access to Information; *Community Development; Elementary Secondary Education; *Information Technology; Networks; *Rural Areas; *Rural Development; School Involvement; Small Towns; *Telecommunications
IDENTIFIERS	Access to Technology; *Technology Implementation; *Telecommunications Infrastructure; Telecommunications Policy; Universal Service (Telecommunications)

ABSTRACT

This proceedings contains keynote speeches, community case studies, and small-group recommendations concerned with successful telecommunications initiatives in rural communities. The four keynote addresses are: "Electronic Highways and Byways: Converging Technologies and Rural Development" (Heather E. Hudson); "Information Technologies and Rural Community Viability: Lessons from the Past" (J. Paul Yarbrough); "Investment in the Rural Infrastructure: The Lessons from the First 100 Years" (Mary McDermott); and "Community Social Capital and Leadership: Keys to the Technological Future of Rural Communities" (Daryl Hobbs). Community strategies for taking advantage of new technologies, problems encountered, and successes and failures are described in eight community case studies: "GRANeT: Grant County, Wisconsin" (Terry Gibson, Tom Schmitz); "Telemedicine: Hays, Kansas" (Robert Cox); "Fiber to Every Home: Kalona, Iowa" (Ronald Slechta, Ray Marner); "ACENet: Athens, Ohio" (Amy Borgstrom); "Nevada, Missouri: The TeleCommunity Project" (Alan Kenyon); "Mitchell, South Dakota: The Teleport" (Dan Muck, Chris Paustian); "Telecommunications Builds on Long-Term Community Development: Aurora, Nebraska" (Gary Warren, Dixie Whitlow); and "Traversenet: Wheaton, Minnesota" (Darrell Zimmerman, Jim Milne, Earl Steffens). In the final section, "Making Wise Choices: Ideas and Observations Concerning Ways To Improve Use of New Telecommunications Technologies by Rural Communities," five community representatives, policy experts, and researchers highlight problems in technology use and the benefits and opportunities available for schools, health care, local government, and businesses. The presenters were Ray Marner, Alex Weego, Peter Korsching, Dom Caristi, and Tom Tate. Specific recommendations for community telecommunications development, generated in small group discussions, are summarized. A participant list is included. (SV)

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Telecommunications for Rural Community Viability:

Making Wise Choices

PROCEEDINGS

FEBRUARY 25-27, 1997
EMBASSY SUITES HOTEL
KANSAS CITY, MISSOURI

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Telecommunications for Rural Community Viability

Making Wise Choices

Proceedings of a Workshop
Feb. 25-27, 1997
Kansas City, Missouri

Eric A. Abbott
Editor

Supported by the North Central Regional Center for Rural Development

With Additional Support from
The Farm Foundation and the
Rural Development Initiative Project at Iowa State University

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Introduction

"We are at a point in time at which the major players in this area...need to assess the problems and opportunities created by these technologies."

Over the last 10 years, telecommunications technologies such as the Internet, computer-mediated communication, and interactive video — once only future visions for rural communities — are now readily available and useful tools. As a number of communities have either succeeded or failed in their efforts to adopt and use these technologies, lessons have been learned that can help facilitate future community efforts, inform policy makers and telecommunications providers, and raise questions that require additional research. We are at a point in time at which the major players in this area — community development practitioners, state policy makers, telecommunications providers, and rural development scholars — need to assess the problems and opportunities created by these technologies, and the optimum forms of state and community policies that lead to their productive use.

The main objective of this workshop was to encourage dialogue among community development practitioners, state rural development councils, telecommunications providers, and telecommunication and rural development scholars. Specific outputs of the workshop were to:

- Share and highlight specific examples of rural community telecommunications activities: what has worked and what has not. Eight communities from eight different states made presentations.
- Construct an agenda for future telecommunications research and community development that builds upon needs identified by community representatives, policy makers and telecommunications providers.
- Identify useful materials such as community planning guides, research summaries, expert contacts and policy making materials that can be developed to assist state policy makers and rural communities in more effectively using telecommunications technologies. Both this proceedings and additional resources concerning telecommunications and rural development may be found at the following world wide web address:

http://www.soc.iastate.edu/rdi-tech/page7.html

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Electronic Highways and Byways: Converging Technologies and Rural Development

Dr. Heather E. Hudson

Dr. Heather E. Hudson is Professor and Director, Telecommunications Management and Policy Program, University of San Francisco, and author of a number of books on telecommunications and rural development

1. The Changing Rural Environment

Rural America is facing wrenching economic and demographic changes. Services are the fastest growing sector in the rural economy, and are becoming increasingly information-intensive. Like their urban counterparts, rural businesses need to "work smarter" to keep up with technological changes and compete in global markets.

Education and medical services are also facing wrenching changes. In some states, faltering rural economies and migration from rural to urban areas have resulted in the closing of schools and reduced access to medical care. Yet population shifts are not the only challenge. Many states have legislated new curricula designed to raise educational standards, but rural schools generally lack the funds to attract specialized teachers. Rural areas are also experiencing severe shortages of physicians, so that residents must travel long distances to regional health centers, and may go without treatment or preventive care until their condition becomes critical.

Education and health care services are also vital to rural economies. As one observer commented: "If a community doesn't recognize the value of its health care system and loses it, it doesn't just lose the health care system. It loses a great big piece of the economic machine of that community."

2. The Changing Technological Environment

Technology is also changing at what often feels like warp speed. Yet buried in the hype for everything from personal communications services to multimedia is the fact that many of these recent technological trends have significant implications for rural services. Among these trends are:

- **Capacity:** New technologies such as optical fiber have enormous capacity to carry information. They can be used for anything from motion video for distance education to transmission of highly detailed images for remote diagnosis.

- **Ubiquity:** Advances in wireless technology such as cellular radio and rural radio subscriber systems offer affordable means of serving isolated rural customers. These technologies make it possible to serve rural communities without laying cable or stringing copper wire, and to provide mobile and portable communications for health care workers virtually anywhere.
- **Digitization**: Telecommunications networks are becoming totally digital. This means that any type of information, including voice and video, may be sent as a stream of bits in "compressed form" and reconstructed for use at the receiving end. Compressed video offers the possibility of relatively low cost video for distance education, and for transmission of medical imagery.
- **Convergence:** The convergence of telecommunications, data processing, and imaging technologies is ushering in the era of multimedia, in which voice, data, and images may be combined according to the needs of users for medical diagnosis, patient monitoring, continuing education, and other applications.

"The convergence of telecommunications, data processing and imaging technologies is ushering in the era of multimedia, in which voice, data and images may be combined according to the needs of users for medical diagnosis, patient monitoring, continuing education, and other applications"

3. **Telecommunications and Rural Development**

To link these trends with rural development, we must first recognize that information is critical to social and economic development. What drew me to this field was what I learned about the importance of information, initially from people living in remote areas of Alaska and the Canadian North where telecommunications facilities were limited or nonexistent. From them I learned that access to information and the ability to share information are critical to get help in emergencies, to get expert advice, to continue learning, and to stay in touch with colleagues and relatives.

Research on the role of telecommunication in rural development has shown that instantaneous communication can help improve:

- *efficiency*, or the ratio of output to cost;
- *effectiveness*, or the quality of products and services; and
- *equity*, or the distribution of benefits throughout the society.

However, many other factors may influence whether and to what extent telecommunications may make an impact. Generally, certain levels of other basic infrastructure as well as organizational activity are required for the indirect benefits of telecommunications to be realized - that is, telecommunications may be seen a *complement* in development - not a sole contributor. We must resist the temptation to see telecommunications as some sort of magic bullet or solution that's going to make a difference in our communities.

4. **Telecommunications in Distance Education**

One field in which telecommunications can have a significant impact in

terms of both effectiveness and equity is education Five basic models have evolved for distance education:

- **The curriculum-sharing model:** links schools so that courses available at one school can be taught to students at another location. This approach typically connects students in a local area or county using microwave and now more commonly fiber optic links between the schools.
- **The outside expert model:** involves identifying course content that is not available in many rural schools, developing specialized instructional programming, and delivering the programs to the schools. These projects are typically regional or national in scope; many use satellites to transmit the courses to the schools and phone lines for interaction with students.
- **The consortium model:** has been applied in higher education, so that several universities join together to deliver courses to remote students. The major example of this approach is the National Technological University (NTU) which delivers graduate technical courses via satellite to engineers at their workplaces throughout the country.
- **The educational broker** delivers seminars and courses via satellite from a wide variety of sources. An example is NUTN, the National University Teleconferencing Network, based in Oklahoma. NUTN offers a wide range of adult and continuing education programs from many sources.
- **The virtual classroom:** Students equipped with computers and modems can access course materials, submit assignments and interact with instructors online from their home or workplace.

5. **Rural Telemedicine:**

Telecommunications can also make medical services more accessible in rural areas. We may group telemedicine applications into several major categories:

- **Emergency services**: such as E911 and mobile communications with emergency vehicles and staff;
- **Remote diagnosis:** such as transmission of medical data and images and consultation with distant specialists
- **Patient monitoring:** such as transmission of patient data from home or rural clinic and communication with field staff
- **Administration:** such as accessing and updating medical records, supplies and inventory, insurance billing
- **Education:** such as degree and credential instruction in health care fields and continuing medical education.
- **Research and information sharing:** such as access to medical data bases and libraries, and consultation with experts and peers

6. **The Need for Vision: A Developmental Approach**

Telecommunications technologies and services can be used for all of these applications and more that we have not yet discovered. The operative word is

can. Whether these applications will be widely implemented may depend on the vision of rural residents as well as the actions of telecommunications planners and policy makers.

To start with, we need a vision of the future that includes both social and economic goals for rural development, and recognizes that information — access, sharing, and dissemination — will contribute to achieving these goals. The next step is to ensure that individuals and organizations in every state have available the telecommunications facilities and services to meet their information needs. I believe that there are four fundamental criteria that are needed in implementing this vision:

- **Accessibility:** We should strive to ensure that the widest possible range of telecommunications facilities and services are available throughout each state, and that all Americans have access to basic services.
- **Equity**: We need to ensure that there are not disparities in access to telecommunications technologies and services. That is, in addition to maintaining universal access to basic services (however they are to be defined), we need to make sure that individuals and organizations that serve them are not penalized because of where they live or what telecommunications companies offer services to them.
- **Connectivity:** In the future, there may be several providers of telecommunications services in each rural area. We need to ensure that there is universal connectivity, so that all telecommunications users can communicate with each other and with information sources regardless of who provides their services or what technology links them to networks.
- **Flexibility:** We must recognize that changing technologies and the introduction of new services mean that we will have to be flexible in setting targets and adjusting to change.

"...change is the norm in telecommunications. Universal service must therefore be a moving target."

7. **Universal Service: A Moving Target**

With the almost daily announcements of new products and new industry alliances, we must recognize that change is the norm in telecommunications. Universal service must therefore be a moving target. Thus goals should not be stated in terms of a specific technology or service provider (such as optical fiber to the home provided by the local telephone company) but in terms of functions and capabilities (such as ability to transmit voice and data and possibly video in some cases; and ability to access information services).

These goals should apply not only to residential customers but to facilities such as schools, clinics, libraries, and community centers. Therefore, we need to rethink the unit of analysis used to measure universality. In the past, universal service was defined in terms of individual access, typically using the household as the unit of analysis --for example, national data are cited in terms of the percentage of households with telephone service. However, **we need to broaden** our definition to encompass **access to services that telecommunica-**

tions can deliver to individual residents through community or institutional access. Thus, we might have a multi-level definition of access, identifying requirements within households, within communities and for education social service providers. For example:

- Level One: household access
- Level Two: community access (e.g. libraries, post offices, community centers)
- Level Three: institutional access (schools, hospitals, clinics, etc.)

8. **The Danger of Electronic Islands and Ghettos**

National goals of inter-operability and openness will be critically important to ensure that users are not left on "electronic islands" because their service provider is not interconnected with other networks. Yet even if networks are connected, there is still a danger of creating electronic ghettos, low profit regions such as inner cities and rural areas, that carriers and service providers may have little incentive to serve or upgrade. There is already evidence of rural ghettos in the U.S.: rural areas served by the Bell Operating Companies and large independents have generally been the last to be upgraded to digital switching, and to have switches equipped with Signaling System 7 (SS7) and ISDN. Ironically, customers of some rural telephone companies that have modernized are effectively isolated if the connecting carriers do not offer similar services.

"The goal should therefore be universal access to a wide range of services at comparable (not necessarily identical) prices across the country."

Pricing can also result in electronic ghettos, even where services are available. Fiber links will not bring promised benefits for health and education if health services and schools cannot afford to use them. Similarly, rural consumers will not benefit from communication and information services priced beyond their reach. The goal should therefore be universal access to a wide range of services at comparable (not necessarily identical) prices across the country.

9. **The Telecommunications Act and Rural Development**

Now that we have considered why telecommunications is important for our vision of rural development, we need to examine how the new Telecommunications Act can help to achieve this vision.

The Act says that policies for the preservation and advancement of universal service are based on the following principles:

"(1) *Quality and rates: Quality* services should be available at *just, reasonable, and affordable* rates.
(2) *Access to advanced services:* Access to advanced telecommunications and information services should be provided in *all regions* of the Nation.
(3) *Access in rural and high cost areas:* Consumers in all regions of the Nation,

including low-income consumers and those in rural, insular, and high cost areas, should have access to telecommunications and information *services*, including interexchange services and advanced telecommunications and information services, that are *reasonably comparable* to those services provided in urban areas and that are available at *rates* that are *reasonably comparable* to rates charged for similar services in urban areas" (italics added).

There are also explicit provisions for rural health care providers and for education and libraries:

"(A) *Health care providers for rural areas:* A telecommunications carrier shall, upon receiving a bona fide request, provide telecommunications services which are necessary for the provision of health care services in a State, including instruction relating to such services, to any public or nonprofit health care provider that serves persons who reside in rural areas in that State at *rates that are reasonably comparable* to rates charged for similar services in urban areas in that State. A telecommunications carrier providing service under this paragraph shall be entitled to have an amount equal to the difference, if any, between the rates for services provided to health care providers for rural areas in a State and the rates for similar services provided to other customers in comparable rural areas in that State treated as a service obligation as a part of its obligation to participate in the mechanisms to preserve and advance universal service.

(B) Educational providers and libraries: All telecommunications carriers serving a geographic area shall, upon a bona fide request for any of its services that are within the definition of universal service provide such services to elementary schools, secondary schools, and libraries for educational purposes at *rates less than the amounts charged for similar services to other parties.* The discount shall be an amount that is appropriate and necessary to ensure *affordable access* to and use of such services by such entities" (italics added).

10. **What Needs to be Done?**

Education and Coordination:

We will need to educate rural residents, businesses and social service providers so that they are aware of how they could be using telecommunications and of the options available to them, are able to make informed decisions about these options, understand the pricing of the services, and know how to get assistance if they have problems with access, pricing, reliability, or other issues. There needs to be coordination among regulators and legislators, health, education and social service agencies, and consumer representatives involved with rural telecommunications.

Aggregating User Demand:

Rural areas often lack economies of scale that would make provision of new services attractive. Both carriers and customers can take steps to aggregate demand in low volume rural areas. Small telephone companies may aggregate their traffic to provide sufficient demand to attract new services. For example, Iowa Network Services is a consortium of small telephone companies in Iowa that have joined together to build a fiber network to deliver their traffic to a Point of Presence (POP) where the traffic can be picked up by long distance carriers. INS made this investment to attract additional long distance carriers and to provide an attractive market for other new services.

Sharing Access:

"We need funding for pilot projects, and for consumer education."

Another approach is to encourage sharing of facilities that are already available. State lotteries may already have high quality data links in rural areas. Other government agencies may also have leased facilities from rural carriers or installed their own networks. The spare capacity can be made available for health care and social service users.

Funding for Pilot Projects:

We need funding for pilot projects and field trials, and for consumer education. The federal National Telecommunications and Information Administration (NTIA) and Rural Utilities Service (RUS) of the USDA have made some funds available for rural demonstration projects. We also need state-level support and contributions from other sources including foundations and the telecommunications industry.

How Will We Achieve the Vision?

We will need to monitor the implementation of the Telecommunications Act to make sure that its goals of comparable rates and comparable services are achieved. We will also have to revise benchmarks for universal service and redefine advanced services as technologies and user needs change.

Communications policy and rural development in the past have seemed to be "two solitudes" of people from different backgrounds. However, we need to bridge the gap between these fields to create a shared vision of rural America in the Information Age. The steps in implementing the vision will need to come from rural users as well as policy makers, government agencies and the telecommunications industry.

We know what telecommunications and information technologies *can* do to help achieve rural development goals. Whether their full promise *will* be realized depends on our shared vision and our dedication to achieving it.

Information Technologies and Rural Community Viability: Lessons from the Past

J. Paul Yarbrough

I for one am completely convinced that we have not just entered the information age sometime on Thursday afternoon in 1958. Rather, this is something that has been coming for a long time. Some of the most dramatic changes in information technology occurred in the last century. I can't think of anything that has been as great a disjunction in terms of how humans communicate than the invention of the telegraph, where distance simply became irrelevant and it became irrelevant all at once. Many people in that time and at that place understood that it was different and important, and they commented on it.

There have been a whole stream of technologies, the telegraph being one which grew up to be the telephone and which is now growing up to be the telecommunications systems we are interested in today. There was the invention of photography at about the same time as the invention of the telegraph. Photography grew up, leading to the movies, and television. A lot of traditional technologies also changed. There was a complete revolution in terms of printing technology. It was not until the 1800s that we had a true mass media, partly because we didn't have presses fast enough to print hundreds of thousands of copies of a newspaper until the inventions of the 1800s.

In one sense, some of the things we're looking at in terms of communication technologies and communities we have looked at before. Yogi Berra would say "it's *déjà vu* all over again." I want to look at two of these technology streams. One is the **telegraph/telephone** — how it developed and how it impacted rural areas. The second is the combination of **printing technology**, mass communication/media that developed in that same time period — and one we don't often think of as a communication system — the **post office**. One of the largest impacts on rural America was rural free delivery — parcel post — which led to lots of conflict in communities.

Another thing that happened during this period — and one question is to what extent communication was part of it — was what Roland Warren, the sociologist, calls "The Great Change" in communities. By great change what he means is our transition from locality-based communities that are relatively

Paul Yarbrough is a professor of Communication, Cornell University, Ithaca, NY. He is the author of "Information Technology and Rural Economic Development: Evidence from Historical and Contemporary Research," prepared for the Office of Technology Assessment, U.S. Congress, 1990.

self-sufficient, relatively bounded which you can study and understand as a single unit, over to the type of system that we have today — which is very much an open system in which the horizontal ties and linkages within the community have been greatly weakened, where autonomy within that community has been greatly weakened, and the vertical ties, the kinds of organizations that link to the outside — the bank, the newspaper, and virtually every other institution within the community — have strengthened. Nearly always those vertical ties are more important and stronger than are the horizontal ties. As a matter of fact, the change has been so great that some have argued maybe we might as well forget about locality as a significant arena of social interaction and start talking about communities of interest such as the floating crap games that are emerging within the Internet. They say those are where the real communities are. Warren, by the way, completely disagrees with that and says it's absurd to throw locality out because place, where we live, and where we carry out most of our actions, is still important. We need to understand how we can strengthen vertical and horizontal links. Let's look at the technologies.

The Telegraph

Samuel Morse spent about 10 or 15 years developing the telegraph. He was only one of many people in both the United States and Europe trying to develop a means of signaling/communicating via electricity. Because with the discovery of the relationship between electricity and magnetism, scientists understood that we could send an electrical current through a wire, activate an electromagnet, and we could communicate.

We can get some idea of the importance of the telegraph by looking at how we moved messages before it was invented. In the United States in 1830 you could move a message from New York City almost to the end of Maine in one week. You could make it to my home town of St. Marys, Georgia, within one week. In 1830, just before the railroads and telegraph came in, we were traveling and moving messages at twice the rate we were moving them only 30 years before. In 1800, it took two weeks to reach approximately this same distance. Another important thing is that by 1830, New York City had become the dominant information and economic capital of the United States and later was to become the economic capital of the world. Much of that advantage came because of the investments they made in communication. New York City established "packet" sailing ships going from New York City to Liverpool back in the late 1700s so every seven days you had a ship going back and forth between England and the Colonies. They had established packet service going up and down the coast. Daily newspapers really had their start in New York City. And the flow of information that went from one community to another really flowed through newspapers and the reprinting of articles from one paper to another. Newspaper publishers then, and still do, exchange copies with other editors. Incidentally, the postal

service encourages that by giving free postage. You don't pay anything to send copies to other editors. They also gave preference in terms of mail routes. The first thing that went through was the exchange papers rather than anything else. So, the first class mail got left behind. Second class mail went through. New York City became important in terms of this because it had aggressive editors. It had editors who were so interested in getting recent news that they would send ships out to Sandy Point and meet ships coming in. We found that if Boston got news about Charleston, it generally got news about Charleston through New York. The New York papers would reprint news from Charleston. The Boston papers would get their news about Charleston out of New York papers.

With the telegraph, we completely killed that. Messages could travel at near the speed of light. It's virtually instantaneous that we can get information from all over. Let's look at some of the chronology of the things that happened in terms of diffusion of the telegraph in the United States. In 1844, the demonstration system telegraph was built from Baltimore to Washington with a special appropriation by Congress. The first message going across created an instant sensation — high levels of interest among lots of people. By 1846, within two years, the Northeast Corridor was completely wired. So, Boston could talk to New York City, could talk to Philadelphia, could talk to Baltimore, could talk to Washington. Within two more years, every state east of the Mississippi River was tied into this grid. If you study the diffusion of innovations, I think you'd have to conclude that this is fast. I don't know of anything else of major importance that has spread this fast in our society. We got into war with Mexico, so we extended the line to Texas in time to get news reports back about that war. Henry David Thoreau, who has always been one to throw water on the party of technocrats, is one of the few people who had anything negative to say about this. And he said: "But what if the people of Maine have nothing to say to the people of Texas?" We never quite answered that one!

The telegraph: "I don't know of anything else of major importance that has spread this fast in our society."

In 1858, the first transatlantic cable was completed. Queen Victoria and President Buchanan exchanged messages. This was met with jubilation. Politicians were beside themselves in terms of superlatives — what this meant to us — how we were tying the world together. "We are entering an information age" is one of the quotes that comes out of this. The system never worked very well. It had so much resistance in the wire that you could get only 6 characters per minute across that wire. They were often verbal and had lots of trouble. It finally failed within a few weeks. It failed mainly because the scientist in charge on the England end decided that what he needed to do was put more power into the line to the point that he literally blew the insulation off the wires and that was the end of that cable. The cable was reestablished by 1866 and we've had continuous communications from that point onward. Incidentally, this 1858 period of jubilation is the only recorded time that I know of that people

have gone into the streets, held parades, had fireworks, and celebrated an information technology.

The transcontinental cable, completed in 1861, replaced the famed pony express system which by the way had only been in business for 19 months. It cut down a 7-day journey by pony to virtually nothing and cut the price of sending the message enormously over this longer distance.

Telegraph in terms of the numbers of messages went up and went down. It really took a long time before it peaked in the United States. During World War II we sent 236 million telegrams within one year. That sounds like a lot but that translates out as 1.5 messages per person per year. Not a high flow of information on a mass basis. If you compare that to telephone calls, the average person engages in 2,500 telephone calls per year today. That's without using the Internet. We get 700 pieces of mail per year. So, the telegraph never became that kind of mass medium. But it did affect us and it affected us because it affected businesses which were the primary users and it affected newspapers which used it as a means of getting information for news and then reprinting. So the impact on most people was very much a secondary, not primary, effect.

"...this 1858 period of jubilation is the only recorded time that I know of that people have gone into the streets, held parades, had fireworks and celebrated an information technology."

How did it change us? Well, the first adopters were financial services — people in the markets. People who were betting on the price of grain in Cincinnati. That was what the futures were. That's where speculation was back in the 1840s. Place became the basis of speculation. Before the telegraph, you guessed about what the supply was in Cincinnati, and you guessed what the demand was in New York City. That's where you placed your bet. When the telegraph came in, everybody got the same information. People in Cincinnati knew what their supply was, and people in New York City knew what the supply was in Cincinnati, so the information was leveled. Financial services, the first major users of the telegraph, continue to be major users of the telegraph. They continue to be the first and major users of new electronic communication systems. And now we haven't built just national markets; we've built world markets. What happens in Tokyo affects what happens on Wall Street. What happens on Wall Street affects what happens in Malaysia, and so forth.

Railroads were the first to use the telegraph for management purposes. The management problem was basically how do you deal with two trains headed in opposite directions over the same track? One solution was to run the eastbound trains on even days of the week, and run the westbound trains on odd days of the week. That works by the way, but you cut down on the amount of traffic you can send over a particular line. Other kinds of signaling systems never quite worked. We kept crashing trains into one another. The Erie Railroad was one of the first to begin using the telegraph for scheduling. In addition to scheduling and messaging ahead so that one train pulled over until another one passed, they cen-

tralized those controls, so that they were actually throwing those switches from a central office. They found that they increased the efficiency of the whole system and this management of railroads became the model of managing many other businesses. Very soon they were using the telegraph to centralize traffic control for all kinds of businesses, using the telegraph to tie it together. Another aspect is that the railroads required some uniform system of time keeping. They are the ones that sponsored standard time. Many farmers objected that the cows would be affected by changing local time. But, the telegraph also provided a means for this. Think about how that has regulated our lives. Before we had standard time, we basically operated our lives according to the sun.

Another thing that the telegraph did, and the telephone extended this, was that it allowed businesses to grow up and to grow out. By growing up I mean businesses began to be centralized. Before the telegraph, if you owned a cotton mill, most likely you lived in the same community as that cotton mill because it was necessary for you to be at the mill to manage it. As the telegraph came in, it became possible to move the management functions of businesses into the most favorable locales, which turned out to be central cities because there you can begin to address financial services. You could get all kinds of expert advice easily within that central locale. So management moved out of the hinterland and into the central locale. At the same time, you could manage routinized operations from this center to wherever it would be convenient to have a manufacturing plant. The advantage of this for rural areas is that it allowed much manufacturing to grow out into rural areas. The greatest area of growth and manufacturing in the United States in the latter half of this century has been in rural areas. Manufacturing has been growing in rural areas while declining in central areas.

"The telegraph never became important for social communication in the United States, though it did in Europe. This is primarily a matter of pricing."

Newspapers were also changed. For daily newspapers, the telegraph became the primary mode of gaining information and recency became the primary news value. Something is important because it just happened. The President said today and therefore it is news. Recency became important. For metropolitan newspapers, telegraph-collected information became the basis of their news. This put the rural press at a disadvantage because the urban papers started moving into rural areas and taking over circulation. What the rural areas did was discover, or invented, local news. They found out that what they would report was information that no one else was interested in. This turns out to still occupy most of our small town papers today. So we've got a differentiation of role.

The telegraph never became important for social communication in the United States, though it did in Europe. This is primarily a matter of pricing. But we've been impacted in many ways indirectly — impacted because the news begins to standardize our life that is coming in over the telegraph, to stan-

dardize time controls. The kind of work we can do now depends on location. The job market depends on location, because businesses have coalesced in different kinds of areas. And life becomes increasingly dominated by decisions made by people elsewhere. Usually that's a relative few in urban centers.

The Telephone

Alexander Graham Bell labeled his patent for the telephone as improvements in telegraphy. As a matter of fact, he started out to build a multiplex telegraph where you could send multiple messages over the same wire at the same time. He soon found out that this harmonic telegraph could actually hum. So he said, if it hums, maybe I could make it talk by going through these different frequencies. By 1876, he was demonstrating this telephone and this is the apparatus he had operating at the International Exposition in Philadelphia. By the late 1800s, only about one percent of the households in the United States had telephones. Part of that was easy to understand if you look at the tariff rates involved. Telephone rental for a year cost between a third and a half of a working man's salary for that year. Not many working men had telephones. But business professionals began to have telephones, and they became very important.

"In 1910, Iowa led the nation in terms of the number of rural households that had telephones. Ninety percent of rural households in Iowa had a telephone in 1910."

Bell chose to focus on building an interstate network rather than seeing how many houses they could wire up within the locale. Incidentally, this is the same pattern by which our road systems were built, and the same pattern by which the telegraph system was built. It is also the same pattern which serves as trunk lines for radio programs and television programs even today. In 1898, he was beginning to get the major network built all the way out to here — Kansas City. By 1904, he got most of it closed in. By 1917, the system was essentially completed except for some very sparsely populated western locales.

When Bell patents ran out, everybody and his brother got into the telephone business including some of the progenitors of the cooperatives in the midwest. These became one of the major avenues for building telephones. And telephones began to explode in terms of numbers. In 1910, Iowa led the nation in terms of the number of rural households that had telephones. Ninety percent of rural households in Iowa had a telephone in 1910. It was nearly that high in eastern Nebraska, Illinois, other midwestern states. This was possible primarily because farmers learned how to build phone systems, not very good ones, on the cheap. They literally built fence post to fence post sometimes with barbed wire as a major conductor. Rural areas outdistanced the nation in 1920 overall in terms of telephone penetration with about 38 percent of the households having a telephone. It was only about 36 percent for the entire nation. And this is despite the fact that in the South almost no one had a telephone.

Then, the rural telephone system went to pot. And it went to pot mainly

because the rural economy went to pot, reducing farm prices. Although the Great Depression did not begin nationally until 1929, it began for rural farm states in the early 1920s. The phone system declined so that by 1940 only about 25 percent of rural households had a telephone system. It was only with the advent of REA loans that the system then began to be rebuilt. Finally, it was rebuilt so that rural areas slightly outdistanced urban areas in terms of telephone penetration. I would submit, by the way, that this would never have occurred without rural subsidies — the economics would simply have not warranted it otherwise.

What did the telephone do? Well, in many ways it was an improved telegraph. As the network grew, the telephone became more valuable to individuals. An important function of the telephone as opposed to the telegraph and mass media systems is that individuals began to both originate and receive information. It began to tie things together on a local level. That really increased the local economy and was very important.

Newspapers and Rural Free Delivery

A little bit about **newspapers**. Though we invented the high capacity printing press in the 1830s, it was really about 1880 before we got a takeoff in terms of daily newspaper circulation. There were only about 7 newspapers per 100 persons published in the United States in 1880, but that had zoomed up to about 30 per 100 by the early 19-teens and 20s. And except for the Depression, it remained at this level until after World War II and then began to decline. Weekly newspapers followed the same kind of pattern but started going down much more rapidly because as the rural economy deteriorated, newspapers went away. I don't have national data, but I've done a lot of study of Iowa newspapers, and I found in a peak year — 1911 — there were 912 weekly newspapers published in Iowa for about 2.5 million people. Every town of 500 population had a newspaper as far as I could determine. And most towns of 250 population had a newspaper. Many small towns had competing newspapers. Charles City, Iowa, had a population of 10,000 people at that time. It had competing morning and evening newspapers — four daily newspapers. Multiple papers started falling out first; we've seen successively that it takes a larger and larger population center to support a newspaper. Now, there is virtually no town of less than 1,000 and almost no town of less than 2,500 that supports a weekly newspaper in rural areas. That's important for rural communities, because like the telephone, weekly newspapers provided some of those horizontal ties that are important to community organization and community development.

One of the culprits within all this is something that farmers were very much in favor of and that was rural free delivery. Prior to rural free delivery, which came in experimentally in 1896, and was finally enacted into law in 1902,

farmers got their newspaper by going to the nearest neighborhood post office which would be a trip of 2-3 miles to get their mail. They tended to go on a weekly basis rather than a daily basis. So, mail delivery was erratic; daily newspapers did not get into rural areas because if you waited a week you had an armload of dated daily newspapers rather than timely daily newspapers.

Most of these post offices — in 1900 there were 76,000 post offices in the United States — were also stores. A store became the general gathering place. To give you an example, I've found about three communities that have been studied in terms of what happened as rural free delivery came in. One is Marathon, Iowa. A study of Marathan talks about businesses beginning to centralize into Marathon. Marathon now has 1100 people in it. It is difficult for me to imagine anything centralizing into Marathon. But in this region, before rural free delivery came in, there were post offices at Messengerville, at Texas Valley, Freetown, Hunts Corner, and at Marathon. Three rural routes were established out of Marathon, and three of the other post offices closed. As those post offices closed, the stores with them very quickly went away. Each of these communities had churches. By the 1920s, the churches were tottering, and by 1930 the churches were gone — essentially these neighborhoods were gone. This is a microcosm of what is happening today as things continue to centralize. And they centralize partly because of the way we organize our communication system. Now farmers were not too unhappy about these neighborhood stores going out of business. In their view, they charged too much, and they got very little out of them, but they got a lot by getting daily newspaper delivery to them via rural free delivery. And they began to subscribe. Two-thirds of the families in the midwest seem to have subscribed to daily newspapers after rural free delivery was instigated. Before, almost no farm families subscribed to daily newspapers.

"Urban media brought rural people into the cultural mainstream... Urban media, by coming into those communities, began tying rural areas into the larger system."

Impacts of Communication Technologies

Changes in the post office, telegraph, and telephone changed rural communities in several ways. First of all, the telephone and local newspapers strengthened local ties. We had communication organizations that helped build community at a local level, helped build local economy. Urban media brought rural people into the cultural mainstream. One of the major complaints of rural areas in the early 1900s was social isolation. They were not having the kind of contact they wanted. Urban media, by coming into those communities, began tying rural areas into the larger system, building vertical ties, often at the expense of horizontal ties. The media enabled rural people to participate in a national consumer economy. Rural free delivery, parcel post, and Sears Roebuck catalogs were a very major part of this. Incidentally, this set the stage for much conflict between farmers and small town businesses in the early 1900s.

There were some additional types of results. New ideas that the rural

population were getting through information coming from the new information systems was beginning to lead to greater efficiency, particularly in terms of farming production. So, the new ideas, farm magazines, extension services, bulletins, advice of all sorts were beginning to increase farm production. This, incidentally, had a negative side as well — it put farmers out of business. New economic opportunities began to open as ranch plants, manufacturing plants began to settle into rural areas. On the negative side, local tradesmen faced more external competition, competition that they often did not need. The cultural transfer was mainly a one-way street. That is, rural people learned a lot about cities, but cities did not learn much about rural people. That pattern is still there today.

More efficient agricultural production, by the way, had very much a down side. And that is that it resulted in recurring surpluses, depressed prices, and requiring fewer and fewer people to produce agricultural output, and fewer and fewer people in rural communities to service that farm population. Some of the problem that you are dealing with today is due to the very success of rural America — the success of its agricultural system. It is a system that has become phenomenally productive, but there are costs associated with it. And those are some of the problems we are grappling with today.

"...information technologies of a century ago...from an economic standpoint had more negative consequences for rural America than positive."

On balance, I conclude that information technologies of a century ago could be revolutionary, but from an economic standpoint, they had more negative consequences for rural America than positive. These technologies have been central to the great change in American communities. As a matter of fact, it's difficult to begin to realize how we could have had this great change without the technology providing the infrastructure for the flow of vertical messages. They certainly contributed for the most part to the losses of local economy. But they helped rural residents become more fully integrated into a larger society. The bottom line of whether this is good or bad depends on what you value.

Investment in Rural Infrastructure: The Lessons from the First 100 Years

Mary McDermott

Mary McDermott is vice president, Legal and Regulatory Affairs, and General Counsel, U.S. Telephone Association.

I am very pleased to be here with you today. As you know from the program, I am from the United States Telephone Association - USTA. I've found that the key to success for "keynote" speakers is to keep it short. So - BRIEFLY - let me tell you a little bit about the 1200 local exchange companies that belong to USTA. Telling their stories is the most interesting way I know to give you some feel for what's happening in the local telecommunications industry as a result of the new federal law, technology changes, and the changing needs of an information society.

USTA's 1200 members include all seven — soon apparently to be five — Regional Bell Companies — as well as GTE. Those eight form our "Large Company Committee." We have 25 companies — including Alltel, Citizens and Illinois Consolidated — who consider themselves "mid-size." The largest of these is Southern New England Telephone, with 2 million lines. The smallest is Mankato Telephone Company in Minnesota, serving just about 25,000 lines. The vast majority of USTA members — over one thousand of them — are small companies, typically serving 5,000 access lines in a rural area of the country. Every year, USTA publishes a list of the biggest 150 local telephone companies. Number 150 has under 9,000 lines. So you can imagine the size of the hundreds and hundreds that are smaller.

USTA's Small Company members serve about 3 percent of the population. BUT -- they serve over 40 percent of the geography of this country. They make their revenues very differently from the big companies in our industry. On average, they make two-thirds of their revenues from access charges, both federal and state. Those are the charges that long distance carriers pay to use the local network. A number of companies earn 80 percent from this source. In contrast, large telephone companies earn a little less than one third of their revenues from access charges. You can understand why rural telephone companies are very concerned about the FCC's current proceeding to restructure access charges. Access charges have traditionally subsidized local rates. AT&T and MCI in that proceeding have said that those charges should be reduced down to their incremental cost. They are recommending an immediate cut of about $11 billion. Rural telephone companies have only one-half the business customer base proportionately,

compared to large companies. About 18 percent of rural lines are business lines, compared with 36 percent of the base for larger companies. These business percentages are key to rural telecommunications. There is no margin for error in dealing with rural markets and rural companies. The loss of one or two business customers can be decimating to the company. By the time that regulators or the government can step in to "correct" the problem, it is all over. The company cannot get back those crucial business customers.

Rural telephone companies have lower basic telephone rates than the national average. The national average basic telephone rates for basic residence service is about $20, including the federal subscriber line charge. The basic rate in rural areas might be $6 or $7 or $10. But — very significantly — the total bill for rural subscribers is, on average, $5 more than their urban counterparts. The average bill, nationwide, is $40 while in rural areas it is $45. Why? Because many of the calls that rural customers make are toll calls — even to the school, the hospital, and to the next community. And why is that? I am sure that I do not need to remind you about the challenges of density in rural areas. But I will anyway. On average, rural companies serve 20 subscribers per mile. But that figure masks some dramatic variations. One half of the rural companies have 8 or fewer subscribers per mile. In contrast, the large telephone companies have an average of 400 subscribers per mile. Just a couple of examples illustrate the vast spaces facing most rural companies.

"One half of the rural companies have 8 or fewer subscribers per mile. In contrast, the large telephone companies have an average of 400 subscribers per mile."

- Keystone Arthur Telephone Company in rural Nebraska is very typical. They serve 650 customers spread over 700 square miles.
- One of our Board members is from Union Telephone, in Wyoming. Union has about 6500 subscribers in Wyoming, spilling over a bit into Utah and Colorado. These 6500 subscribers are in an area that is bigger than the state of Ohio. And yet Union has offered long distance service since the1940's. Its cellular subscribers outnumber its wireline customers by about 2 to 1.
- On my office wall is a picture of the Cisco, Utah exchange. Served by Emory Telephone Cooperative, this town has a population of five people. The fact that it has three subscribers is a very good ratio. Cisco is 64 miles from the telephone switching office, and so those three telephone lines are 64 miles long. Not surprisingly, it is not first on the list of markets that competitors are lining up to serve! Fortunately for Emory Telephone, Cisco is not their only exchange. This cooperative serves just over 4,000 lines spread over more than 5,000 square miles.

One of my jobs at USTA is to meet with people from foreign telephone companies that come to learn about the U.S. experience. All of those folks are shocked to learn that the local telephone industry in this country has over 1200 players. And all of them want to know, how are these companies going to survive? I do not have a crystal ball, but let me tell you what I tell them about the

initiatives rural companies are taking. Around 400 of the companies provide cable TV service in addition to telephone service. With the opportunities created by the new federal telecommunications law, a number of these companies are launching competitive telecommunications into adjacent areas using their cable companies as the launch pad. At least 100 rural companies are DBS — satellite TV — distributors. At least 150 of the companies are involved in some aspect of the long distance business. And more companies are considering that market. At least 20 companies own parts of fiber rings that provide competitive access services.

More and more companies, large and small, are becoming Internet access providers. Our estimate, growing every day, is 200 small companies offering Internet service. More than 500 rural companies have cellular operations. Many were winners in the recent auctions for Personal Communications Services Spectrum. Most of the PCS efforts are consortia, and an interesting fact is that electric utilities are often part of group.

"I know this audience will understand how hard it is to correct the myth that rural aras are technological backwaters....But the fact is that rural telephone companies have digital switches in 98% of their networks."

The new legislation includes discounted telecom services for schools and libraries. Rural telephone companies did not need Washington to tell them the importance of bringing these services to the kids in their areas. Here are some examples:

- Smithville Telephone in Indiana has installed a broadcast quality video learning system at eleven schools. Using that network, students have hooked up with counterparts in Germany and Japan.
- Victor Cooperative Telephone in Iowa has connected schools in three countries with broadband video facilities and Internet hook-ups.
- Hiawatha Telephone on Michigan's Upper Peninsula has provided video links to 15 schools in three counties for distance learning.
- West Central Telephone in Minnesota provided two local school districts with Internet access and equipment and training.
- Great Plains Communications in Nebraska, working with other telephone companies, is building a DS-3 (broadband) distance learning video network, reaching across the state.
- Polar Communications in North Dakota has provided free fiber optic connections to five schools for video applications.
- In South Dakota, Dakota Cooperative has provided toll-free access to the Internet, and a discounted rate for schools.
- Eleven Wisconsin companies joined together to provide DS-3 (broadband) video distance learning to13 schools in western Wisconsin. The companies included Spring Valley, Clearlake, Baldwin and Somerset.

I know this audience will understand how hard it is to correct the myth that rural areas are technological backwaters. We fight against that stereotype every day. But the fact is that rural telephone companies have digital switches in

98 percent of their networks. Thanks to the REA, that 98 percent is a significantly better percentage than the figure ior the large companies. More than 70 percent of their interoffice network is fiber optics. And more than 15 percent of the "loop" plant is now fiber — including those distance learning networks I just mentioned. Every day, day in and day out, these companies provide a range of innovative services in the toughest parts of this country to serve.

And over and over I hear from our members that the key to success is community involvement, cooperation, and working with their customers to plan and to aggregate community demand. Telecommunications is vital to economic development in rural communities — everyone involved in telecommunications policy claims to understand that. But my members have a deeply held belief that telecommunications is just as vital to the personal well being of the people living in rural America. [As Senator Conrad Burns put it at USTA's 1996 Convention: "People say to me 'My gosh, how do you make a living in Montana? We go through here and we don't see anything for miles!' And I say, 'You know what? There's people in houses in Montana, and they've got faces, and they've got dreams too, and their needs are the same as anybody in any other part of this country. I represent a big state. From one end to the other is further than from Washington, D.C., to Chicago. So, I've got to deal with distances. But you know what? Our kids are just as important, their eyes are just as bright, and their dreams are just as valid as any other kid's. They just want an opportunity, and local telephone companies are a vital part of the infrastructure that will allow them that.'"]

"Over and over I hear from our members that the key to success is community involvement, cooperation and working with their customers to plan and to aggregate community demand."

Consumers in this country will benefit from the new law. That is a virtual certainty. But the pace and even the size of these benefits depend upon the implementation effort that's going on in Washington, D.C. USTA is still optimistic, but frankly, there are signs that implementation may not go well for rural areas. Today, in this country, we keep local telephone rates low by charging above cost prices for access charges, long distance, business and urban rates. That money subsidizes residence and rural service. Congress understood that such a system cannot survive in a competitive market. So the law directs a joint Board of FCC and state commissioners to recommend a new framework for preserving affordable, universal telephone service.

That Joint Board issued its recommendations Nov. 8, 1996. The Board proposes two changes to Universal Service funding that will be very damaging to rural telephone companies. First, the Joint Board would cut off Universal Service funding for most business lines and for all but the FIRST line into residences. That means that many businesses in rural areas will be facing basic telephone rates approaching $100 per month. If this happens, you can bet it will become harder to attract businesses to rural areas. As for second lines in residences, consumers would be facing the same astronomical rates. Cutting off funding for second lines in rural areas would greatly add to the cost of Internet

and computer access. In some areas we have found penetrations of 30-40 percent of second lines.

This recommendation to exclude business and second lines is so devastating, I just have to give some real examples. The nationwide average cost (not the price — the cost) of the line between the customer and the telephone switching office is $248 per year. At Dell Telephone Co-op in Texas, that cost is $2,600 per year. At South Central Telephone in Kansas, the line cost is $1,200 per year. Rural Telco in Idaho has an annual cost of about $950 per year. Century Telephone of Northern Wisconsin is at $590 — more than double the national average. And so on. One of the telephone companies participating here - and this was a coincidence -is about $100 per line above the nationwide average — $358. We are fighting hard to keep all lines eligible in rural areas. Our second issue is this. The Joint Board also recommends that the amount of universial service support for the rural telephone company lines that are eligible be frozen at 1995 levels. The freeze will apply until well after the turn of the century. This freeze will chill any plans for investment in the telecommunications infrastructure by rural companies.

"Now, let me end with the advice that USTA gives to its members as we begin this nationwide transformation of the communications industry. Focus on your customer. Do smart strategic planning. Find your individual path to success and have the will to carry it out."

Companies with commitments to upgrade their infrastructure — including commitments to their states — will have to request rate increases in order to maintain financial stability. The problems will be particularly acute for those rural companies that have recently acquired areas that have been unserved, or underserved and need substantial upgrades to bring them up to par.

There is something you can do about this situation. The FCC must decide by May 8 of this year whether to accept or modify the Joint Board recommendation. You can contact the four members of the FCC by writing them a letter or e-mail. The record is still open. Tell them that freezing universal support for rural companies and not supporting all lines will harm economic development in your state. If you want to learn more about these issues, contact me. I will get you in touch with a rural telephone company in your state that can talk about the impact in your community.

Now, let me end with the advice that USTA gives to its members as we begin this nationwide transformation of the communications industry. Focus on your customer. Do smart strategic planning. Find your individual path to success and have the will to carry it out. This is a critical time for all of us. You will need to make "bet your company"or "bet your community" decisions. If you bet wrong now, there will be no opportunity two years from now to say "oops" and start again. May all of us make "Wise Choices." Thank you very much.

Community Social Capital and Leadership: Keys to the Technological Future of Rural Communities

Daryl Hobbs

We have already been through a century and a half of technological transformations impacting rural areas. The impacts on rural areas have been to further urbanize them, making them backwaters of urban centers. Rural areas have adapted to the technologies' changes.

Today we are talking about the onset of technologies that can do many different things. We must keep in mind, however, that telecommunications technologies are not a single dedicated technology, but a wide range of technologies with many different purposes. There is a temptation to talk about total technological determinism. One question is, how are rural areas going to use these tools? There is only one thing missing: communities helping communities figure out what they would like to do. Putting community in front is what we are talking about here.

A paradigm shift on the order of Thomas Kuhn has occurred. And here we have a second central question that that has not been looked at as much. What impact is globalization of technologies having on rural communities today? There is a need for communities to move from the "industrial era" into a new era.

There has been too much emphasis in community economic development on attracting jobs to communities. Now we have situations where one family member must hold three jobs in order to earn enough money for the family to survive. There are too many jobs, and not enough income. After World War II, the United States led the world in manufacturing of almost everything. Today, we don't lead in very many categories. Missouri's shoe factories have moved to Mexico. Ninety percent of the economy has nothing to do with goods and services. These global forces will impact rural communities whether or not they do anything.

Developers continue to think in terms of roads in relation to the delivery of goods and services. We transport kids 30 miles a day to teach them to read. But now we are in a totally different era. It is possible for a kid in a rural

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county town of 400 to get a first class physics course without leaving town.

The decades 1900-1970 saw large scale rural to urban migration. This was an incredible subsidy to urban areas, representing a huge transfer of human capital. The population peak of most rural Missouri counties came about 1900. In 1970, there was a major shift, with more people moving to rural areas than leaving them. Zenith TV moved 1400 jobs from Chicago to Springfield, Mo. But those jobs have now moved on to Mexico. Competition is now global. The population turnaround of the 1970s was possible because people now could live where they wanted to. Retired people could live where they wanted and collect their social security checks. Many moved back to the rural areas from which they came.

Then the farm crisis of the 1980s hit. And rural areas again lost population. But from 1990 to 1995, there has been another tremendous relocation of population in the United States to rural areas. People aren't aware this has happened. In Iowa, only 7 counties gained population from 1980-90, but 45 did so between 1990-95. In Nebraska, only 10 counties gained between 1980-90, but 47 did so between 1990-95. In Missouri, rural areas that lost 65,000 from 1980-90 gained 82,000 during the first five years of the 90s. Rural America is becoming a desirable location. Why?

"From 1990 to 1995, there has been another tremendous relocation of population in the United States to rural areas. People aren't aware this has happened."

One answer has to do with current occupations. We now produce information, design strategies, handle legal issues, produce entertainment, and provide many other services. Nike doesn't produce shoes -- they are a marketing company. The shoes are produced under contract by others. When we add telecommunications technologies, we have a very different kind of occupational mix. Your body can be anywhere and your mind can go forward an earn a living. Sears had its huge headquarters in Chicago. But the current leading retailer has its headquarters in an 8,000 sq. ft., Butler Building.

California, New York and Maryland are losing population. Why? Because of the cost of living and quality of life. These are amenities that rural communities can provide. But rural communities need education to show them that the old days are over and there are new opportunities — new ways to produce. There is no single technology that will help rural communities. It is a wide range of technologies and needs to be part of the educational agenda.

For the past 250 years technologies have made people into cogs of machines. They have deskilled them, even though many were well paid. Now, we are devising machines that are extensions of human beings. We need to rethink our whole approach. The Internet is said to be doubling every 9 months. By 2000, 1 billion people will have access. The importance of this is that these people will be operating in a common social and market space. This is another opportunity for rural

communities. The case study community of Aurora, Nebraska, demonstrates that the Internet can be a two-way street.

Unlike the past, when the Extension service was able to construct general models for community development, there no longer can be a common model for every rural community. Now, communities must select niches that match their skills, history and location, and that contribute to their viability and quality of life. The Internet thrives on diversity. In tomorrow's businesses, relationships may be more important than ownership. The Internet can be a democratizing technology. Those who have lacked a voice can now have one. What will decline? National government. Community diversity may be seen as a strength in the future. The Internet creates "virtual communities" -- communities of networks, not of places. What we are talking about is how they can take advantage of the new tools to enhance the communities of place.

A 1988 national assessment of communities used traditional yardsticks of communities such as proximity to Interstate highways, education system, and links to railroads in an effort to predict job growth. These traditional indicators could explain only 17 percent of job growth. Indicators such as social capital of a community and its leadership were the key factors during recent years. In the community case studies presented at this workshop, there was a different moving force in each case: a local organization, Extension, different movers. In the past, we have been focusing on development in the community. Now, we must focus on development of the community -- development of the community's capacity.

"Now, communities must select niches that match their skills, history and location, and that contribute to their viability and quality of life."

There is a necessity for collaboration. Old hierarchical structures are outmoded and getting in the way. The REA, hospital boards, and school boards are examples. A person may attend a meeting at one of these organizations each night of the week, and consider them as entirely separate entities. But they aren't anymore. Their activities must be integrated and they must collaborate in this new era. One example of integration and collaboration is the creation of a network of five schools and a community college here in Missouri, a project to which my wife gave leadership. As it turns out, this type of problem is primarily organizational in nature, not technological.

Rural communities need to have a vision. Most rural communities today don't have a vision. They have never engaged in a visioning process. As one of the community case study teams stated, "You can' t spend too much time drawing the big picture. You need strategic planning." Also, the most effective communities have found ways to use outside resources effectively. How can Land Grant Universities help link communities to these outside resources and opportunities? We haven't done a very good job here.

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The best communities invest in themselves. Rural communities are often thought of as being without resources. That's wrong. Rural communities have many resources. But where are they invested? Not there. We haven't given communities excuses to invest in themselves. They need to keep capital in the community.

In terms of leadership, we have many rural leaders who are dedicated to the status quo. We need a new generation of leaders -- they need to buy into a new vision, and then help make it happen. In rural areas a dedicated person can make a big difference in a short time. There is less bureaucracy. There are volunteers.

"In terms of economic development, take the example of the Nevada, Missouri, case study. The community has stopped chasing jobs and is now focusing on how to attract investment. The focus should be on attracting income, not jobs."

In terms of economic development, take the example of the Nevada, Missouri, community case study. The community has stopped chasing jobs and is now focusing on how to attract investment. The focus should be on attracting income, not jobs. Bring the kids back. They need education. Now they need new opportunities. Nevada is trying to attract "teleworkers."

How can Land Grant Universities help here? There is much information needed.

- Information on how to produce change;
- Information on technologies -- what they can do for us. For example, how can these technologies change our schools, health care delivery system, governmental system, etc.?
- Information about our own communities. This is not something one finds currently being taught in schools. If we want to prepare our young people for careers in their own rural communities, we must enlist their help in collecting needed information about their communities, and then get their help in analyzing it. This is what will help build future local leaders.

The technologies we have now are potentially decentralizing. But what about technological obsolesence? Of course, a technology today is obsolete when you buy it. But that's not the issue. The issue is, what can you do now with technology you have that you couldn't do before. Instead of having communities wait and wait in hopes that a new improved technology will come, they must look at what could be done now with available technologies.

Who will be the providers of telecommunications services in the future? The answer to this question may be complex. It may be the phone company, cable company, or utilities. One also must also consider the potential impacts of new wireless telecommunications systems.

What is intellectual property, and how will it be affected? Traditionally, intellectual property such as copyright has been linked to a tangible product. Now, on the Internet, how do you copyright it?

At present, the Internet has no central control, but is pretty well organized any-

way. This may be an excellent model for the future. There is always the debate between law and ethics. Central control of the Internet by government edict would represent law. But in rural communities, rule by ethics has always dominated. In the new era, we may see much more focus on the development of rule by ethics rather than by law.

Introduction to Eight Community Case Studies

Eight communities representing eight different states and a number of different approaches to utilizing telecommunications technologies were asked to describe how their communities organized themselves to take advantage of these technologies, and to provide specifics about both their accomplishments and failures.

The eight communities were selected by contacting telecommunications policymakers in each North Central Region state and asking for nominations of communities known to be active in telecommunications technologies. The conference planning team then selected the communities in order to provide the greatest diversity possible in terms of technology use and organizational methods.

The cases were seen as central to the workshop, in that they represent the voices of the communities themselves — their accomplishments as well as their statements of future needs. Later in the conference, representatives of these communities, along with the policymakers, educators, and providers, were asked to develop a list of ideas concerning how communities might best be helped to take advantage of these technologies in the future. The resulting ideas are presented in the final proceedings section entitled "Making Wise Choices."

GRANeT: Grant County, Wisconsin

Presenters:
Terry Gibson, professor and director of program support
Cooperative Extension Service, University of Wisconsin-Extension/Madison
Tom Schmitz, county office chairperson and youth development agent,
Grant County Cooperative Extension, University of Wisconsin-Extension

GRANeT, located in Grant County, Wisconsin, brings together people, community information, and low cost computer services to form a community network that connects all of Grant County's communities and citizens. GRANeT makes use of audiotext, faxback, and the WWW to link K-12 schools, libraries, governments (county, city, village and town), non-profit organizations, business and industry, community groups, and higher education as part of a statewide initiative called the Wisconsin Community Information Partnership.

"We may be rural, but we're not remote." This is a phrase that the economic development people have used successfully in trying to attract businesses to Grant County. This case highlights the ability of a community partnership to design a county-wide information system to link communities, schools, businesses and citizens.

GRANeT, launched in 1993, brings together people, community information, and low cost computer services to form a prototype community network that connects all of Grant County's communities and citizens. GRANeT makes use of audiotex, faxback, and the Internet to link K-12 schools, libraries, governments (county, city, village and town), non-profit organizations, business and industry, community groups, and higher education institutions within Grant County as part of a statewide initiative called the Wisconsin Community Information Partnership.

Three Sources of System Access

There are three basic sources of access to the system and six levels of use. INFO-LISTEN permits residents to dial a local phone number and select from a printed list of 1-5 minute audio messages on more than 500 subjects. A catalog with the list of available topics has been circulated widely in the community. INFO-FAX again uses the local telephone to request that information

be faxed to the recipient's or a commercial or public fax machine. Many convenience stores, for example, now have fax machines. This information consists of maps, bus schedules and other material of 1-10 pages. These two sources are designed to be the most comprehensive source of community information available in Grant County. All information from these two sources is provided free. It cost about $7,000 to set up these first two levels of information. The actual information for levels one and two is stored on the same computer.

The third level of information, INFO-NETWORK, requires use of a computer and modem. The most basic service is a computerized bulletin board service that anyone with a computer and modem may access with no password. Text information on community activities, office hours, emergency phone numbers, etc. is provided at this level. Although the rapid growth of the Internet has drawn attention to more sophisticated on-line services, there may still be considerable potential for basic on-line bulletin board services at the community level. The fourth level permits the sending and receiving of e-mail, database searches, and forums on topics of local interest, but it requires an Internet link. The fifth level permits connections to the Internet and the World Wide Web. World Wide Web pages now offer county or community-level information to users, but links provide ways of winding up in the same place no matter where you start. All except the smallest communities now offer WWW links. Graphics are strictly limited on WWW pages to avoid the problem of lengthy downloads. The sixth level, which provides for computer conferencing and distance learning, is still in the master plan, but has not yet been implemented. At present, there is an initiative in Wisconsin to create a "BadgerNet" that would link schools in the state via T1 lines for $250 per month. All Internet/WWW pages are located on a server at the University of Wisconsin-Plattville and are provided as a public service by the university.

At the time the project was initiated, there were no Internet Service Providers in Grant County, and the only Internet link was available through the University of Wisconsin-Plattville. Grant County consists of 19 communities and 49,000 residents located in the southwest corner of Wisconsin. It includes the University of Wisconsin - Plattville, the largest single employer, and is predominately agricultural. Plattville has a population of 10,000. Grant County is the tenth largest county in the state. The county has a history of collaboration in education and vocational training. There was a recognition that resources were limited, and there was much to gain by communities working together rather than fighting over the scarce resources.

The GRANeT initiative was spurred on initially by some federal NTIA-TIAP Round I dollars, and supported by University of Wisconsin-Extension. The emphasis from the beginning has been on connecting the communities. The county was selected as the appropriate unit because of the strong county governmental structure, including the University of Wisconsin Extension. However, the

focus also was on community-to-community connections, and only secondarily to the region, the state, and the world.

Emphasis on Universal Access

From the beginning, we felt that the real power of this system was not in giving people access to the Internet and the world, but really in trying to harness some of the power within the community. There was emphasis on universal access to the system across communities in Grant County. This was accomplished with the first level, which requires only the use of a telephone, and the second level, that utilizes a faxback capability. These two levels got people thinking about information, and away from thinking only about computers. It forced them to think about what types of information they had to share, and avoided controversy over the fact that not everyone has a computer.

Information provided on the GRANeT system is created and placed on the system by community organizations, governmental units, businesses, educational institutions, etc. Units link to the system, provide an access number, and then are able to create or update messages. The initial grant funds also permitted Extension to create informational messages and WWW pages. At the initial stage, project staff invited community organizations and businesses to attend a meeting at which prototype messages on the various levels were demonstrated. About 70 people showed up at the meeting. It was clear that they wanted to be included and provide their own messages on the system. The systems were also demonstrated at a community fair for four days.

Although there were no local Internet Service Providers in the beginning, within a year, local phone companies began providing local access because they could see the potential.

Initial Problems

A number of problems had to be addressed when setting the system up. There are a number of different communities and phone systems in the county, and calls from one community to the other involve long distance charges. So University of Wisconsin-Extension had to spend some time trying to figure out how to minimize those charges -- which calls could be made for 5 cents a minute as opposed to 10 cents a minute. The result was three phone numbers in different communities that provide information access. In some areas, a tie line is used and some calls are subsidized by the project to keep costs low. When we initially brought the managers of the local phone companies together, they said "there's no way this can be done." But when we brought some of the field folk together, they said "Oh, sure there's a way." And in about 20 minutes it was done. You have to ask the right people at the Telcos.

Although there were no local Internet Service Providers in the beginning, within a year, local phone companies began providing local access because they could see the potential. There are now six Internet providers in

Grant County who are competing with each other and providing unlimited Internet access for about $20 per month (the same as the going rate currently in Madison). Their prices have come down since they were launched. When the project started, the local phone companies were there, but they said "Aw, there's no interest."

Types of information on the system at present include:

- Maps of communities that can be downloaded or faxed;
- Business directories, often provided by the local chamber of commerce;
- Events directories and tourism information;
- Jobs available in southwest Wisconsin and Grant County

Future Sustainability

In this case, there were federal dollars available to get the system developed and launched. Now, the question of sustainability of the system is becoming important, and will require much more systematic attention. There is a local steering committee that represents organizations and businesses providing information on the system. There have been some leadership problems on the steering committee and some lapses over time. To date, there has been no cost/benefit analysis of the project, and no real formal evaluation. Statistics on access use are being accumulated. After 79 weeks of Web page access, the average number of accesses per week is 3,000. The rate of increase is going up pretty dramatically. A number of people report that they have learned about GRANeT through Web pages. There were 4,000 phone calls using the audiotex services in a 12-month period.

In terms of page editing or surveillance, thus far materials provided on GRANeT pages have concerned local economic development and other appropriate topics, and no censorship issues have come up yet. Information about Grant County now is linked to other servers such as the Wisconsin tourism pages. Local commercial servers also are linked to GRANeT pages. It is planned that private firms wishing to have links from GRANeT will pay a $100 fee. This has not yet been implemented. However, any business can have a "white pages" listing for free.

Grant County Extension currently does not provide public access to the Internet from its computers because there are too few computers and too little staff time to provide training.

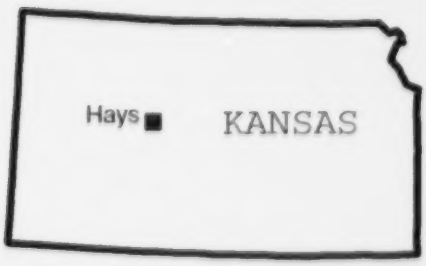
Telemedicine: Hays, Kansas

Presenter:
Robert Cox, Director, Rural Development and Telemedicine
Hays Medical Center

Telemedicine in Hays, Kansas, began in 1988 as an idea and a need. The network opened with three Kansas University Medical School sites in 1991. Since then, over 15 sites have become active. Medical administration meetings, medical education offerings, and clinical services are transmitted electronically.

In 1988 Dr. Robert Cox a pediatrician at Hays Medical Center in Hays, Kansas initiated the idea of Telemedicine there. Dr. Cox and his staff had been working long hours resulting in severe stress. In search of assistance, he went to the University of Kansas to develop programs that would provide after-hours coverage with interactive video, match medical needs with medical resources, and identify technology that could be applied to existing relationships. The key individuals involved in the development and decision making of the program were Dr. Robert Cox, Primary Advocate/Champion; the Information Technology Director, the Executive Vice Chancellor of the University of Kansas, and the clinical sub-specialists in the medical center.

It was critical to have a champion for the technology. Dr. Cox gave up his practice to become full-fledged implementer of telemedicine. It involved considerable work in terms of learning the technology, creating awareness in the hospital, and championing it among the doctors and administrators. Dr. Cox, by virtue of being a medical practitioner, had the necessary credibility to discuss telemedicine with the other doctors who were viewing it with suspicion and in some instances as a threat. The Director of Information Technology's interest and ability to influence the appropriate people in the medical center was critical in moving the project forward.



The organizations involved in the telemedicine project were: the University of Kansas, the Area Health Education Center (AHEC), Hays Medical Center, Essential Access Community Hospital/Rural Primary Care Hospital (EACH/RPCH), and Individual physicians. Resources for the project were obtained from the Kansas University Medical Center, State of Kansas, Mead-Johnson Nutritionals, Kansas Health Foundation, Rural Utilities Service, U.S. Department of Commerce, Hays Medical Center, and EACH/RPCH.

Projects accomplished

Interactive video conferencing

This was the first application of telemedicine. It was used for clinical consultation -- cardiology, psychiatry (20%), medical administration (40%), and continuing education and coursework (40%). Although initially it was expected that clinical consultation would be the primary use of telemedicine, medical administration and continuing medical education have been the more popular uses. The technology was better developed for distance learning and teleconferencing, and perhaps there was less resistance to using it for these tasks. Continuing education using video conferencing is an excellent way to reduce travel costs and dislocation of local services. In addition to physicians, it can be used by nurses, assistants, and other health professionals.

Emergency department support

This is critical for rural hospitals with only one or a few doctors. A small town primary care practitioner solely responsible for providing medical care has a very busy work schedule in the morning, unending late night phone calls, and the stress of taking all the responsibility for coverage. Emergency department support provides call coverage relief. This eases pressure on the physician, leads to a better work environment, and reduces errors made due to fatigue from prolonged work hours. Electronic access to emergency departments changes the medical lifestyle of rural physicians and improves the ability to recruit and retain physicians and other health professionals in rural communities. The cost of these systems for communities is easily offset by savings in patient transfer to urban hospitals. The services used are clinical consultation, reducing emergency referrals, and assisting nurses in attending to emergency room patients.

Teleradiology

Using traditional telephone lines, rural communities are able to obtain immediate consultations on radiology interpretation services rather than wait several days for the mail system or for a visit of the circuit-riding radiologist. This is a popular service in rural areas and is used extensively by primary care physicians. However, license issues across state lines constrain the use of these services. Radiologists are slowly developing a trust in the technology and feel confident that their diagnostics on teleradiology are comparable with conventional methods.

Home Health Telemedicine

This service is used to treat fragile patients, and reduce emergency room visits and hospitalizations. Homes are wired to provide service through cable TV. A camera is attached on both ends so that the patient and the nurse can have one-on-one conversation using the TV monitor. It has been found that the patient's self-esteem has improved and it has also meant patients can live longer at home rather than moving to an extended-care facility. The cost for a telemedicine visit is estimated to be half the cost of an on-site visit. Other services that can be delivered to the home are: rehabilitation, speech pathology, and oncology. It could be effectively used in nursing homes and extended care facilities.

What Did and Did Not Work Well

What worked well included video conferencing for administration, education and to some extent clinical consultation, emergency department support, home health telemedicine, and teleradiology. A spin-off effect was the information technology and services support for smaller hospitals. What did not work well included clinical consultation, emergency department support, home health telemedicine (due to the small number of households where cable is available), and physician buy-in. The problem with clinical consultation is that physicians were concerned that telemedicine would "suck" patients away. Ten percent were positive toward it, ten percent were negative, and the other 80 percent had a "show me" attitude.

The key to establishing telemedicine locally is an enthusiast to initiate and move the project along.

Barriers To Implementing Telemedicine

Three types of barriers to implementing telemedicine were identified. The first type of barrier relates to regulatory issues such as obtaining an affordable, adequate bandwidth to remote sites, licensing issues in crossing state lines, and liability, which may actually decrease because a record is automatically made of each use. The second type of barrier is economic, relating to reimbursement, cost of equipment, especially the line charge, and maintenance of equipment. Finally, there are knowledge barriers relating to the rapid advances in technology, interest of physicians in using the technology, and community awareness and acceptance of telemedicine.

The key to establishing telemedicine locally is an enthusiast to initiate and move the project along.

Fiber to Every Home: Kalona, Iowa

Presenter:
Ronald Slechta, publisher, The Kalona News and President, Kalona Development, Inc.
Ray Marner, general manager, Kalona Cooperative Telephone Company

Kalona's Cooperative Telephone Company has strategically built its facilities, inside and out, to deliver the most advanced telecommunications technologies to its growing community. This includes serving as an Internet provider and wiring its entire service area with fiber optics in order to offer the latest Internet, ISDN, PCS and other services.

Kalona's case study deals with how a visionary local telephone cooperative, in cooperation with a development organization, can identify ways in which new telecommunications technologies can support economic development. Kalona is the home of the largest Amish community west of the Mississippi. This "conservative but progressive" community had a population of 1,500 with 500 phone lines in 1950. Today, it has a population of 2,000 with 1,800 phone lines. Community planners know that they must look beyond agriculture for development. Tourism, for example, is now bringing 20,000 to 30,000 people to the community each year. Main street businesses that used to provide mainly agricultural services now offer antiques and bed and breakfasts. Medical instrument and plastics manufacturing companies have arrived.

The Kalona Cooperative Telephone Company became an Internet provider in fall, 1996. In January, 1997, there were 86,000 hits on its server, 1,500 hits on the local newspaper's home page (one of the first in Iowa), and 4,500 hits for one local food service company. More than 679 gigbites of data have been downloaded from the Internet server since its installation, and hits on the system have come from more than a dozen countries.

Being an Internet service provider at present is not a money maker, Marner pointed out. "But I wanted to be the provider. And I knew, and it's happening, that we would sell additional access levels and ISDN lines." Marner said he had an individual now who is a marketing person and an Internet person. The plan was to go out and provide seminars to local businesses on the advantages of using the Internet and ISDN. "But we have been swamped with users wanting to receive these services," he said, and as yet have not been able to offer the seminars. The Internet employee is also producing home pages on contract for a

Texas university as well as the local Chamber of Commerce. This is an example of enhanced services that can be made available.

Convergence Is Key to Future

Telecommunications and its potential for Kalona's development became obvious to Marner six years ago when he first heard about convergence at a meeting. He knew then that he needed more knowledge about this topic to see what changes needed to be made at the local level. Marner, who began working for the Kalona phone cooperative in 1960, had previously noticed that whenever the company upgraded service, use increased. This occurred during upgrades from eight party lines to four party lines, from four party to two party, from two party to single lines, and when extension phones were added. "Every time we improved, business improved." Marner believes that convergence is the key to the future, and he sees fiber as the best way to deliver it. By the year 2000, the phone company plans to provide fiber optic links to the door of every home in the community. At present, the Kalona phone company has installed fiber to the curb of each home in a 12 by 12 mile area. But it is not yet to the doors. "I'm not doing this just to make money," Marner said. "I'm doing that too -- we're going to keep the company healthy. Everything we have done enhance the business community. In turn, it increases revenue."

By the year 2000, the phone company plans to provide fiber optic links to the door of every home in the community.

Several years ago, Marner presented a business plan to the phone cooperative board calling for a goal of a fiber-to-the-home system. At that time, the technology was not there to accomplish that. Marner had visited AT&T labs to see what technologies were being developed in this area. When the plan was finalized, there was an $8 million price tag. The plan assumed a 20 per cent increase in population growth in the community. One factor in the plan's adoption was the realization that the types of businesses now in Kalona would need upgraded service. A second factor was that the existing telephone plant was nearing its capacity in usage, and something needed to be done. "We committed ourselves to the plan, and to a $5 rate increase -- $1 per year for five years to cover ourselves on this project. We are now in the second year of that process." R-1 and B-1 phone lines will cost $14.60 per month and multi-line phone rates will be $20 at the end of this rate increase. The new system contains a redundant sef-healing circuit to the outside world, which will be unique for a small rural community. This spring installation of digital switching units will be completed. "We are now working with our cable company to provide cable service to the rural people," Marner added. "We are also working on a deal with the direct satellite people to offer their service through the fiber system. The ONU (Optical Network Units) digital switching units will have that capability." As the project phases have advanced, the price of the equipment needed has declined, so that the total project is now estimated to cost $6 million instead of the original $8 million. In the first quarter of 1998 the digital

switching company will begin providing switches that serve eight residences each -- ideal for rural areas. Ameritech -- a supplier -- is also making plans to provide a TV set-top box for use in the home once the digital network is complete. The goal is to have the whole system operational by the year 2000.

Universal Service Concept Changing

"What does it mean to have universal service?" Marner asked. Presently, it means POTS (plain old telephone service) to every home at an affordable rate. But what will it mean in the era of the Information Highway? It sounds as if the type of service to every home will be advanced. "Clarity, quality, availability and convenience are the things that are driving us now." Marner noted that because the phone company is a full cooperative, it has always emphasized service. Sometimes, this can get in the way of marketability, he said. The phone company even provided a building with rest rooms that have now developed into a Welcome Center that the Chamber of Commerce leases for tourists when it saw that this was needed to spur further tourism development in the community. "At times I have been criticized by my shareholders, but I say 'Look, here's what it does for the whole community.'" Marner said he had also been criticized for promoting the business community at the expense of the whole exchange community. But he points out that the investments in the business community have helped keep rates low for both residential and business phone lines. The phone cooperative also has provided the materials for wiring all school buildings in the telephone company's exchange, and providing one person to supervise the labor. The company will take fiber right to city hall and school buildings, and also has given the local library computers so that they could connect to the Internet.

A banker and a realtor started the Kalona Development Corporation in the 1970s. Kalona Area Development has now become part of the Kalona Chamber of Commerce, incorporated in 1987. This corporation has been instrumental in attracting the new plastics plant and new medical instruments company to the community. When the University of Iowa tried to attract the medical instruments company to move to its technology park, the fact that the phone company planned to provide a new switching service to them convinced them to stay in the community. They have since doubled in size. The new system will enable the company to offer frame relay service, which the local John Deere dealer is interested in to send bursts of data -- a highly efficient means of transmission for them. The medical instruments company and a national church camp located near town have asked for two-way video conferencing capabilities, which can be provided. The cooperative also plans to offer dial-up videoconferencing equipment that can be rented by the day or the week. The new system will have full ISDN capabilities.

The phone industry is beginning to realize the importance of being able to

serve customer needs. But Marner also stressed the importance of being able to meet needs so that customers are not tempted to want to go to another provider. "Our customers still want to have a local face to talk to and deal with. We want to be that face. If we position ourselves there first, we think we really have a step up on competition." Marner noted that at present, he believes there is not a level playing field. Competitors are permitted to come in and use the cooperative's lines at a discounted price underselling the local provider. "But I have a feeling that things will balance out," he said.

Phone Cooperative Rated High

Research done in Kalona by a team from the University of Nebraska's Rural Policy Research Institute studying telecommunications found that 65.5 percent of businesses rate the local telephone company as being "above average" to "greatly above" in economic development efforts. The same percentage saw local telecommunications services as being above average to excellent. A total of 81 percent saw telecommunications as being important to very important to future economic development. Fifty-three percent believe that the use of telecommunications technologies has enabled them to increase their productivity without reducing the labor force.

Kalona Survey: "53% believe that the use of telecommunications technologies has enabled them to increase their productivity without reducing the labor force."

ACENet: Athens, Ohio

Presenter:
Amy Borgstrom, executive director
Appalachian Center for Economic Networks
Athens, Ohio

ACENet is a non-profit community development organization working to revitalize the economy of rural, Appalachian, Ohio. Founded in 1985, ACENet is committed to the development of a sustainable regional economy based on economic justice, self determination and respect for diversity.

Rural Southeastern Ohio Freenet (SEORF) includes 12 counties. Athens, Ohio is a university town of 40,000 when students are present and about 20,000 when the students are gone. This is very rural community with much in common with communities in Kentucky and West Virginia in that they are very rural and very poor. The poverty rate of Athens is 32 percent and it is very isolated. County residents travel great distances for work and services. This county has the distinction of being the only county in Ohio that has no health care provider based within its geographic boundaries. Athens is historically rich in history however, and the residents are resilient, self-reliant, and determined. The area is economically, socially, and historically diverse.

The Appalachian Center for Economic Networks (ACENet) was founded twelve years ago (1985) as a response to addressing the systemic poverty that existed in Athens and surrounding communities. Initial activities included helping people start worker- owned and operated businesses and cooperatives. It helped create 10 businesses, which created approximately 100 new jobs. However, it still was not having the transformative impact that it really wanted, and so the directors began searching nationally for development models. They also researched some of the flexible manufacturing networks that were arising in Northern Italy and Denmark. These networks were helping to revitalize local economies in a way that they had never seen before. As a result, they adapted that model to rural Southeastern Ohio, with resulting great success.

Focus on Specialty Foods and Household Products

Currently the focus is on linking existing businesses, expanding businesses, and new micro-enterprises with new and emerging niche markets. Emphasis is on two markets. The first is specialty foods. ACENet has a small business incubator housed in three buildings and includes a huge kitchen area in which new

foods are developed for production. The second market niche is the production of specialty household products. ACENet, and several other companies work together in the business network model to develop and market a range of motorized, adjustable kitchen cabinets. These are specially designed for people with disabilities, allowing appliances to be moved up and down mechanically for ease in access.

From the Italian example, ACENet learned that as companies grow and expand, they have new needs and demands. As a network, it works with other companies to develop new products, services, programs, and institutions to meet those needs. It has attempted to meet those needs by providing access to capital, aiding in marketing and product development, business assistance, business planning, and workforce development. It is very involved in welfare reform and has organized two programs for people receiving public assistance. In the program, it provides residents on public assistance with training so that by the end of the program, they no longer need or receive such assistance. A final area of ACENet's work is telecommunications.

"ACENet is different from many other community economic development organizations in its use of community networking to link communities to new markets."

Use of Community Networking

ACENet is different from many other community economic development organizations in its use of community networking to link communities to new markets, to groups within the community to create new programs and services, and to link communities across the country and around the world who are working on similar projects and attempting to overcome similar obstacles. ACENet defines community networking as a group of people in a community getting together to solve a problem or to address an opportunity. A community network, however, is a community-owned, based, and driven information system that people use as a platform to do their community networking activities.

ACENet connects firms with markets. It has developed the Public Web Market, in which an Internet based market is used to get a producer's goods out on the market. Individuals in four areas across the country are involved in Internet marketing and commerce. A secure server works through e-mail to service direct links from the producers to the consumers. The model, based on the model of the public market, is interactive with the producers. There are currently 26 companies from Southeastern Ohio on the site.

The success stories are wide but the challenges are even wider. The orders haven't been huge yet, but the learning that has developed for the individual producers has been very successful. This has spurred training and development for the producers and the consumers.

BEST COPY AVAILABLE

Collaboration Efforts

ACENet connects groups within the community to facilitate collaboration. ACENet became involved in the creation of the Southeastern Ohio Regional Freenet, a community network. It was started originally by a group of K-12 educators interested in making available an information resource called Academy One that was developed by the Cleveland Freenet. The ACENet origination was very informal and grew out of a desire to open the network to the larger community. It has been up for two years and has approximately 6,000 subscribers who use it for e-mail purposes. It provides text-only links for the people who enter through the Southeastern Ohio Regional Freenet (SEORF) but provides full web access for people who enter through the outside. Several sites have been located in public buildings for access by people who do not have their own computers. ACENet soon will add a conferencing option for its subscribers.

ACENet is trying to develop a computer core of young people (high school students) to act as trainers and troubleshooters for communities and for businesses.

ACENet links communities together. In 1996, ACENet hosted a conference for ten communities. Like Athens, these communities have focused on food niche marketing. Recently, ACENet helped them access its conferencing system and set up a server for the communities called FoodNet. This system has possibilities in cross-marketing, specialty foods distribution services, and the creation of an association for community networking. The community networking association meets every three months and communicates electronically at other times. There are additional possibilities in the works, but new innovations create problems with training and sufficient staff to manage all of the systems. Therefore, ACENet personnel see the key problem as local communities being unable to provide important training for members of the community. Computer services is becoming a niche-based market all by itself. ACENet is trying to develop a computer core of young people (high school students) to act as trainers and troubleshootes for communities and for businesses.

Navigation between the various services is becoming an increasingly difficult problem. With the sheer volume of sites and interests currently on the web and with the growth of the web, collaboration is lacking.

Nevada, Missouri: The TeleCommunity Project

Presenter:
Alan Kenyon, Executive Director
Nevada Area Economic Development Commission

The Nevada TeleCommunity Project is a rural economic development initiative to create new economic opportunities in Nevada, Missouri. The TeleCommunity Project capitalizes on social, business, demographic, and technological trends that provide new avenues for economic revitalization in rural areas. Key elements of the TeleCommunity Project are: a residential televillage development; a TeleCenter operated by a consortium of universities, colleges and local institutions; an intra-city fiber optics system; an entrepreneurial training program; a low interest revolving loan fund for new enterprises; a teleincubator and speculative office center; and a long-distance telephone services cooperative. The Commission puts approximately $50,000-$75,000 per year into the TeleCommunity Project.

The situation faced by Nevada, population 8,600, is similar to many other rural midwest communities. From 1900 to 1980, Nevada lost 40 percent of its population, with a 3.9 percent loss from 1980 to 1990. The area loses about half of its high school seniors each year -- often the best and the brightest. This means a substantial economic loss for the community, since it spends an average of $4,000 per year per child on education. Most of the reason for the loss is due to a lack of jobs in the local area.

In recent years there have been several economic crises faced by the community. The Nevada State Hospital began downsizing in 1989, and reduced its employees from 1200 to 400 by 1996. The economic business development game has also changed drastically in the past 15 years. More than 10,000 communities now have economic development groups courting industry -- it has become very competitive. Industries considering locating in Nevada

The Nevada Telecommunity Project is a rural economic development initiative to create new economic opportunities. Key elements include a residential televillage development; a TeleCenter operated by a consortuium of universities, colleges and local institutions; an intra-city fiber optics system; an entrepreneurial training program; a low interest revolving loan fund for new enterprises; a teleincubator and speculative office center; and a long-distance telephone services cooperative.

now ask: "What will you give us to bring 50 jobs to the community? How much tax abatement will there be?" "We can ill-afford to mortgage our community's future by giving away our tax base," Kenyon said.

Encouraging Signs for Rural Development

Several converging trends offer encouraging signs for rural development:

1. Problems of big cities, including crime, drugs, poor schools, and long commutes are causing some people to want to move out to rural areas.
2. Corporate downsizing has meant that some talented people can return to rural areas when their jobs are eliminated, if they can make a living.
3. Home-based businesses are growing in importance, and rural communities can attract these individuals. In 1996, nationwide there were 11 million home-based businesses, and they are growing at the rate of 20 percent per year.
4. Telecommunications technology can be a great liberating force for our communities. "This is the frontier for us," Kenyon noted. It offers the possibility of living and working in different places. "It's not the Holy Grail, but it can bring new opportunity," Kenyon said.

Telecommunications technology can be a great liberating force for our communities. "This is the frontier for us," Kenyon noted. It offers the possibility of living and working in different places. "It's not the Holy Grail, but it can bring new opportunity," Kenyon said.

The Nevada Area Economic Development Commission developed its new conceptual plan in 1994-95. Kenyon and others in Nevada believe that it is an alternative to the old economic development model of chasing industry. Communities such as Nevada should consider how to increase their attractiveness so that home-based business people, retirees, and those escaping city life will want to move there. When these types of people move to a community, they bring with them ideas, energy, and capital.

Development Starts with Asset Assessment

Community economic development starts with an assessment of the community's assets. When the State Hospital downsized, it gave the community 700 acres and several buildings, including one 25,000 sq.ft. building suitable for a TeleCenter, and another 66,000 sq.ft. building that was proposed as a Teleincubator. When it was originally proposed that this be turned into a "speculative office facility" to attract new businesses, paralleling other speculative construction for industry, local government accepted the idea. The facility will offer new businesses rental space for $3-$4 per square foot, plus telecommunications linkages. "None of us yet understand the full potential," Kenyon said.

The approach taken by Nevada has been based on local initiative. "If we rely on mandates and subsidies, we're always going to be trailing," Kenyon said. The new approach has four major principles: (1) Create market potential. "If we provide opportunity, market forces will respond." (2) The project is open to all partners -- business, medicine, education, etc. (3) The Commission has worked

to overcome barriers of distance and time. Telecommunications technologies are one tool that can help here. (4) There will be a major effort to capitalize on the growth of home-based businesses.

The Development Commission worked closely with each of four key areas where market demand could be created -- business, government and law enforcement, education, and health care/telemedicine. Each of the four areas also has money that could be tapped to invest in technologies.

In 1995, the group established the Nevada TeleCenter, a 7,000 square foot building with links to each economic group. The TeleCenter subsequently evolved into a partnership of the Development Commission, Cottey College, five state university units, and local schools. It includes two interactive video classrooms (for 25 students each), a computer training lab with 10 stations, a satellite downlink, a multimedia instruction room, and fiber optics connectivity. The TeleCenter now has three T1 lines serving it, and from 5 to 19 courses are offered through the local community college per year. A "virtual university" project has also been launched at the local school. The completion date for the TeleCenter building was October, 1997.

One of the challenges the Commission faced was getting public and private groups to work together. "This was hard for some of the public institutions," Kenyon said.

Aggregate Demand To Reduce Telecommunications Costs

To reduce telecommunications costs, the commission sent letters to more than 200 long distance providers asking for proposed rates to serve the area. A local survey by the Commission found that some local businesses were paying 25 cents/minute. Other small companies were paying only 10.9 cents/minute. Size was not a factor. The goal of this activity was to aggregate long distance phone use to lower rates. A long distance telephone cooperative might be one result, and a new local service company could evolve from that effort. Kenyon stressed that his goal was not to create and operate such services. If private providers or others want to step in and provide the services, that's fine, he said.

The Commission also followed activities at the state level, carefully watching for opportunities to attract government investment and tax credits. Using funds from a local $734,000 pledge campaign, the community has sent lobbyists to Jefferson City to monitor state initiatives and argue for programs that will benefit Nevada. This has paid off very well. The state appropriated $250,000 originally to help refurbish the TeleCenter building, provided funds

for the TeleIncubator, and more recently appropriated $2.1 million to tear down another old building on the site.

Local schools "have been real heroes," agreeing to have the TeleCenter located in their adult education center. They get to use it, and they pay for a technician, heat, and light.

Attract Home-Based Businesses

In order to attract home-based businesses, the commission has contacted Acorn Televillages, Crickhowell, Wales. Rather than focusing on "telecommuting," in which people working for a company may work in an outlying suburban office several days a week, the Acorn focus is on establishment of "teleworking" -- letting people use telecommunications to operate independent businesses from home.

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Mitchell, South Dakota: The Teleport

Presenter:
Dan Muck: Teleport manager
Mitchell Technical Institute,
Mitchell, South Dakota
Chris Paustian, director
Mitchell Technical Institute,
Mitchell, South Dakota

The city of Mitchell (pop: 13,000) has watched its access to the world expand due to the development, in 1988, of a satellite communications technology program on the campus of the Mitchell Technical Institute, a two-year technical college. From that beginning, the Institute, City, State and numerous private partners have worked to develop the MTI Teleport, a gateway for telecommunications in South Dakota and the region.

Mitchell, South Dakota, a community of 13,000, is home to the Mitchell Technical Institute (MTI). In 1988, MTI Satcom was developed due to industry's demand for trained satellite technicians. It remains the only satellite communications training program in the country. Typically, satellite technicians came out of the army ranks to fill positions in teleports and television stations because of their strong background in electronics. Mitchell Tech's foundation of the program arose out of funding from the governor's Office of Economic Development that used money from a source called "Future Funds."

The program is a "living laboratory" for its students. An Earth station and an antennae field were developed and serve as a hub for the telecommunications systems for the institution, the state, and the region. The teleport was initiated through demand for services and through entrepreneurial efforts. The studio was developed so students have an opportunity to work in live situations.

Technet, the initial system, was a distance education system developed through the South Dakota Office of Vocational Education. Technet had 11 sites, was full analog, and operated through full broadcast signals. It was the first statewide multi-point distance learning system in South Dakota. The system was financed through Carl Perkin's Funds and through state dollars at a cost of $350,000. The bulk of the funds were used in creating a mobile up-link

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to enable broadcasting from anywhere in South Dakota. The system died rather quickly due to the cost of buying the full broadcast transponders. Money was available for creating, not maintaining the system.

A Backbone Infrastructure

One major benefit of the system was that it created a high degree of attention for Mitchell around the state, and gave the Technet task force the experience of running a distance learning system. They became a resource for the Governor's Taskforce on Telecommunications Development. The task force gathered representatives from a kaleidoscope of state players. Their conclusions were to create a backbone infrastructure for higher education and government that business also could access.

The system had two components, terrestrial and satellite. The terrestrial component consisted of the ground level sites used to operate and maintain the system. The satellite component eventually created the Rural Development Telecommunications Network (RDT). Its purpose was to provide video-conferencing to higher education, government, and business. It was operated on a scheduling system in which users could schedule time for its use. The system had up-links in 12 of the largest communities in the state.

The structure of the RDT was created by statute, and financed through state funds (Future Funds) to promote economic development. It initially went into place for a year to a year-and-a-half as a terrestrial network before becoming the system that exists today. The task force's vision was to create a third party entity that would operate the network. They had a five-year business plan and during the second year, they were creating a running balance that began to pay for the system. One of the largest users was the state itself. The third party entity did not come into action, however, due to legislative restrictions.

Grant Created Nine-Member Consortium

In response to state efforts, the Sandborn Telephone Cooperative, a highly aggressive organization came forth with a plan to link five rural schools, Mitchell Tech, and other organizations to the system. Applications for RUS Grants were made twice, the second being successful. Sandborn funded the grant writing. The RUS Grant totaled $470,000 and paid for the link to five rural schools, the Mitchell School District, Mitchell Technical Institute, Queen of Peace Hospital, and Dakota Weslyan University. The nine member consortium installed a dark fiber system to connect to the Sandborn lines. The partners contributed about $240,000-$260,000 to the consortium to pay for the links. Sandborn also contributed to the effort and gave a free lease for ten years to each partner.

The state and the two governors in office during the foundation of this project were particularly instrumental in facilitating the process. Six months after the satellite network began operating it was turned over to Mitchell Tech. Mitchell Tech currently operates the satellite network from the campus Teleport Center. While the Teleport Center is a business, it is also an important part of the institution.

The satellite system created a focal point for the state, which forced the community to look at its telecommunications infrastructure. The operation is now called MTI Telcom Systems. It services a partnership of hospital systems for telemedicine in many Midwestern and Western states. The hospitals range from for-profit, to non-profit, and include veteran's hospital networks. MTI also works with cable television operators across South Dakota, Nebraska, and Iowa. MTI places earth stations in isolated areas to allow cable television companies to access them for community information, community education, and community health purposes. MTI built a distance learning network for rural schools that provides rural students courses not taught in their own schools. MTI also operates two digital satellite channels on G-4 satellite with 168 uplink sites connected to them through a variety of methods in several states.

Technovision -- a local think-tank organized to examine the roles of technology on education -- found that whatever affects education also affects the business community.

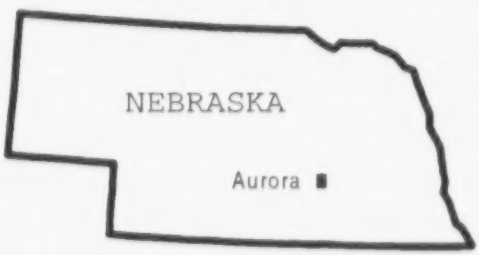
Technovision -- a local think-tank organized to examine the roles of technology on education -- found that whatever affects education also affects the business community. Technovision sat down with the City of Mitchell to decide what issues needed to be addressed in Mitchell with regard to telecommunications. A task force organized to address these issues studied telecommunications law and regulations, and examined potential options for the community. The task force found that the 1996 Telecommunications Act allows Mitchell to become an Independent Service Provider (ISP) and that financing was available through the state law. The task force further concluded that the city needed to act as soon as possible and to announce its intentions. The recommendations were that the City of Mitchell needed to operate a telecommunications company. System and consumer needs were not being met by those systems previously in place. The new telephone system was expected to pay for itself if three percent of the residents in the community signed up for the service. In other communities where this plan was presented, 97 percent signed up for the service.

Telecommunications Builds On Long-Term Community Development: Aurora, Nebraska

Presenter:
Gary Warren, executive vice president
Hamilton Telecommunications
Dixie Whitlow, director of marketing, Hamilton Telecommunications, and chairperson, Information Technology Task Force based in Aurora

With an active county information technology task force and a progressive local telephone company, Aurora and Hamilton County have added jobs by using telecommunications infrastructure, provided community members with the latest information technology tools, and have implemented an educational process for community members to keep on the leading edge of the information age.

Aurora (population 4,250), and Hamilton County (population 9,500) have a county information technology task force that has added jobs to the community by using telecommunications infrastructure, provided community members with the latest information technology tools, and implemented an educational process for community members to keep on the leading edge of the information age. The approach taken has been to build on a community development process that has been going on in Aurora for 35 years. This pre-information-age setting is very strong, and has included an industrial development corporation, community foundations, and health facilities. "I don't want you to ever divorce our company from our community. Never do that, because if you do, you don't have the same company," said Warren.



In 1981, the first digital switch was installed in the community, and by 1988, the company was completely digital in all of its towns. By 1987, two fiber optic rings providing redundancy in service had been installed connecting all towns, and there are now two fiber links out of the community as well. These fiber rings and digital switching caused the telephone company to start thinking about how it was going to pay for these services. A two-pronged strategy has been to expand service area, providing new services for economic development, and at the same time providing opportunities for the telephone company to grow so that it can afford additional investments in the latest telecommunications technology. In 1986, in the depths of the farm crisis, one local businessman noticed an ad in the *Omaha World-Herald* for telemar-

keting jobs. As a result of a discussion with local phone company staff, he then built extra capacity into a new local building, hoping to attract a telemarketer to Aurora. Within a year, he was operating his own telemarketing company in the community. This brought jobs to Aurora, but it also greatly increased use of telecommunications lines, enabling the company to upgrade service to fiber. A second way new technologies have been brought into the community is by taking advantage of grants. When funds became available to provide special phone services for the deaf, it enabled the company to provide new digital switching equipment that could be used by the entire community. Stimulated by increasing use of the Internet by area schools, the company became an Internet provider and now serves many communities outside the regular service area. Now, nine other telephone companies are using the Aurora telco's Internet service. As a result of the expansion of telecommunications services, the Aurora telco has grown from 35-40 employees in 1986 to 250 employees now (200 full time equivalents). That, by itself, represents about $5 million in additional revenue coming into the community. And much of that amount is coming from activities that are new and from outside the community.

A Key Player, a Meeting, and a Strategic Plan

Small telephone companies can play a key role in community development in the information age, along with local computer stores, and banks. To be successful, a community needs a key local player who is committed to attracting resources and working with community businesses and organizations. Outside experts from the university were also helpful in Aurora. One focal point for getting things started in Aurora was a meeting in 1993 to discuss how the community should play the information technology game. Aurora invited a national expert – Don Dillman -- to come to the community to talk about the transition from the agrarian age to the information age. The Chamber of Commerce, city council, and school board, newspaper, churches, health services, businesses and industry were also recruited. "The most important thing we did was to get people to the meeting," Warren said. A typical reaction of people was "I don't have a computer. I don't know much about it." But these people, if convinced, do know where the resources are, and are therefore vital to future success. A total of 175 people attended. Although some only wanted to buy a server and get an Internet link, the organizers focused the meeting more broadly – what can the community do to take advantage of the Information Age? The approach was to attempt to build consensus in the community on this issue – to paint a big picture. This led to a series of surveys, some general, and some of specific community segments. Finally, an Information Technology Strategic Plan was developed. "We thought it was important to put it down in writing, so that those in the community with the vision would receive some validation." Another important step in moving a community forward was to organize a

group that could continue to push the plan along, and to continue to educate the community.

Accomplishments

Accomplishments that followed the development of the strategic plan include the following:

- During the next year, the school board wired all classrooms for the Internet and hired an information technology specialist. "I don't think they did it just because of the plan," Warren said. "But I think they did it with a higher level of comfort as a result of having community consensus that they could go out and spend the bucks on that kind of stuff." There were no grants involved in that. At present, 68 percent of Aurora students have a computer at home. Of that group, 25 percent have on-line access. E-mail is now available to senior citizens through a local school project. Students also have helped local businesses design web pages as a part of project activities. Two-way videoconferencing is being planned for the future, but has not advanced as fast due in part to the lack of a champion at one of the schools to push it along.
- The local computer store teaches Internet classes and a variety of other software courses.
- The city administrator has been an Internet guru, and has played an important role in the development of World Wide Web pages that have made Aurora known worldwide.
- The library bought computers and now has free Internet access provided by the telephone company.
- Agricultural Extension has shown farmers how to take advantage of new technology. A local pet food manufacturer's plant is now completely fiber-based for communication, and they share information with the rest of the task force. Local producers have shared information about Global Positioning technologies.
- The telephone company has put business World Wide Web pages on their server at no charge.
- A local satellite downlink system was set up via a partnership of the telephone company (which operates the cable system), the local hospital, Extension, the Leadership Center and four other local institutions. They now use local cable channel 38 to provide programming to various sites. At present there are 5 scheduled programs per month.
- The local newspaper, a strong supporter of the task force, has put the paper on-line. Supporters believe that the local newspaper plays a critical role in terms of informing the community about the project and supporting it.
- The Edgerton Explore It Center – Nebraska's hands-on science center – has provided demonstrations of information technology and has been an important resource in the community.

Task Force Facilitates Change

The role of the task force has been to facilitate change in the community – not to control or undertake projects itself. Schools had to make their own purchases. Grant money will dry up. "Local support is needed to make this go," Warren said. A task force needs to have both "planners" and "doers," Warren said. Otherwise, you might get doers who skip the planning stage and just go build something. The local phone company has thrown "a bit of money" into the pot from time to time, but collaboration is the key. Others must join. Visionary leadership is needed. "This is about economic change, not wiring the community." In Aurora, the community already has a lot of computer-skilled people who are thinking about how to use the new technology. Warren said that many of the individuals who have been innovators in technology are members of the task force. The Internet should be a two-way street, Warren said. "I have no interest in having a computer where all they do is pay Internet access fees," he said. "What I'm interested in is having people who are on the Internet who have figured out a way to get somebody from the outside to pay them some money to do something."

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The Aurora presenters discussed key roles that several participating organizations have played in their community. One key is to develop the capacity of local telecommunications companies to redefine their role and help position communities for more economic development. A second key role in Aurora was played by a local foundation. They helped generate a "Spirit of Reinvestment" campaign in the community. The approach was to take government money last, and try to raise awareness that people need to put resources back into the community. This has happened at the local community center and library. Warren estimated that $20 million has flowed back into the community over the past 10-15 years.

Traversenet: Wheaton, Minnesota

Presenters:
Darrell Zimmerman, farmer
and custom aerial applicator
Jim Milne, math teacher
and technical coordinator, Wheaton Schools
Earl Steffens, business manager,
Traverse Electric Cooperative

Traversenet, a local dial-up Internet service, was made possible by the whole community of Wheaton, Minnesota, a small rural town, joining together. The Wheaton community task force was created to get this rural community on the information superhighway.

The State of Minnesota has held a Rural/Urban Minnesota Technology Conference for the last two years. These conferences have included the topics of bringing technology to rural areas, enhancing technology in urban areas, and creating a focus for economic development. At one conference session a question was asked, "What are the boundaries of the community?" The definition of community has grown to include areas typically outside the standard, incorporated areas. This extends beyond school district boundaries and beyond traditional economic circles to include outlying communities and rural areas ordinarily left by the wayside. These outlying communities and rural areas have been invited to participate in dialogue and they have taken an active role in this process. Not all barriers have been overcome, however. Local dial-up access to Traversenet has not been available to them in many cases, but they have remained active in their roles as participants in this process. Wheaton also has conducted much information sharing.

Wheaton's task force determined that it was necessary to identify community needs and existing resources to address those needs. Once the needs and resources are identified, technology goals and collaborative efforts are needed to make the process happen. Some of the groups that were identified as players in this process were government, schools, businesses, libraries, health care providers, agriculture, forestry, and also individuals. The identification resulted from a state process called Access Minnesota.

School Played Key Role

One of the key participants in bringing the information highway into the community was the public school system. Three years ago, there was a change in school superintendents in Wheaton. The new superintendent was a veteran educator who was a very strong proponent for using technologies in education. In his first year, he was very instrumental in pushing the board and school district into developing a three year technology plan. The plan included building a telecommunications backbone and infrastructure, purchasing hardware and software, providing staff development, and integrating the technologies into the classroom.

From a school setting, the question was asked why Wheaton needs access to the information highway. It was determined that access to the information highway was necessary because the current information available through that system is vital for young people to keep up in the competing world. The students and staff need to share information with others. It is imperative that they have means of communicating via e-mail both within the schools and with the outside world. The staff and students need access to listserves and databases for the knowledge and information they provide. In rural communities, it is necessary to set up an infrastructure that caters to the needs of its residents so they have local access to the information highway like their urban counterparts have had for some time.

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Grants Help Process

Another key player on the task force was the extension service. Being a county seat, Wheaton had the extension office located in the community. Extension became a player through its part of the Access Minnesota drive. Access Minnesota is a program supported by a national grant from the National Telecommunications Information Administration in the sum of $425,000. An additional $1 million was given in matching grants for resources. These grants were used to establish 60 public access internet sites throughout the state of Minnesota. It was a first-come, first-serve application method. The grants gave Wheaton an opportunity to test the web to see what was out there. It was the goal of the public school system and the county to promote education as a lifelong process. The main goal was in improve the quality of life which meant that it also would improve the educational opportunity for all of the residents of Traverse county. It also would provide business opportunities that would create and stabilize employment opportunities for the residents.

The Wheaton Community Hospital and Rural Health Alliance became involved in the process by procuring several grants to promote cooperation between rural health care providers by the use of telemedicine. The Rural Health

Alliance currently includes 20 rural hospitals in the state. The hospital's telemedicine unit became fully operational in January 1996. The hospital joined the task force when its administrators learned that the community was searching for a way to provide cheap access to Internet resources. The hospital's telemedicine unit only used half of its lines' capacity, and they realized that they could provide this resource to the community.

Traverse Electrical Cooperative is a small electric coop with approximately 2,500 members that operates out of Wheaton. It also became a member of the task force. In an attempt to provide service, the task force sought the cooperation of the local telecommunications provider, as well as alternative revenue sources. One of these is the medical alert service. They were hoping that the Internet would be another alternate revenue source.

Basin Electric and its subsidiary Basin Telecommunications (BTI) desired to promote and offer free access to the Internet to any public school in their service area. Currently, they serve 27 cooperatives. The Wheaton task force brought in BTI to help implement the network and to provide information in the set-up phase. BTI was successful in helping Wheaton's schools become "hooked up," and also helped Wheaton develop a home page to promote tourism and economic development. The process went smoothly because of the high integration of task force members. The Internet service currently costs $40 per month for unlimited access. The network will cash-flow at 75 members, and at that time, Transversenet will be able to reduce the service charge to $25 per month.

Making Wise Choices Ideas and Observations Concerning Ways To Improve Use of New Telecommunications Technologies by Rural Communities

Following the eight community presentations, all participants were involved in a group process of considering how rural communities can be helped to learn about, plan for, and adopt new telecommunications technologies. First, several participants — community representatives, policy experts, government specialists, and researchers — were asked to highlight some of the problems and opportunities involving use of these technologies. Then all participants were divided into small groups to generate lists of ideas.

In this section, the initial presentations were made by the following participants:

- *Ray Marner*
- *Alex Weego*
- *Peter Korsching*
- *Dom Caristi*
- *Tom Tate*

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Ray Marner, General Manager Kalona Cooperative Telephone Company Kalona Iowa

I am looking forward to taking advantage of networking opportunities through Ames as a result of this workshop. I am also looking for challenges: how to direct and how to focus the things that we can use even more in our communities.

An important thing I am taking back from this workshop is the need to look for ways to bond your community, to focus on the idea that it's good for everyone. I've been accused early on of being too aggressive because I'm a part of the telephone company. I want to push all the latest technology on the community, etc. It's said I have some personal private interests and I'm trying to control the community. Those types of things can come out. We need to remember not to back off. We need to address those concerns in a positive way. One of the ways I've done this, and my board of directors has supported me, is to right away focus back on the investment pluses of this. We are a cooperative, and we have shareholders. Everyone who has a phone is a shareholder. That's how we are set up as a cooperative. Instead of seeing it as "spending my money" on new technologies, we have worked to show that this is "investing your money" for the health and welfare of the community. Another criticism is that we promote the business community and not the residential community. But we do promote all. One of the ways we promote all is that the health of the business community directly gives a good investment in our company, which is an added asset to shareholders which helps to keep your rates down. You are able to have all these modern services, including hopefully cable TV as we go forward, where you wouldn't otherwise have them.

"One thing I would encourage a lot of you people to do who are in situations where the phone companies aren't cooperating or progressive is to keep pushing them hard, especially if they are small companies. Talk to them. Ask them a lot of the questions we have been discussing here."

When we go back to Kalona from this conference, we will be promoting the input that we received from you people, and always try to look for ways to promote this and get people to put $5 or what ever the amount into this. It gives them a vested interest in the future and they are going to support it.

One thing I would encourage a lot of you people to do who are in situations where the phone companies aren't cooperating or progressive is to keep pushing them hard, especially if they are small companies. Talk to them. Ask them a lot of the questions we have been discussing here. Ask what they already have in their planning stages, and how the community can help them. With bigger companies, it's harder to deal with them. Challenge them. In this day of competition

and deregulation, challenge the ARBACS and GT. Challenge them to invest in their plant before the need is there. Don't be satisfied that they contribute to local charities. I applaud what the Mitchell, SD, presenters have done about their outdated technology. I would work along with you, even being outside, to encourage you and challenge the Bell Systems there. Having outdated technologies is really a hardship on the whole community. It is a big challenge since only the local community people feel the impact of these limitations -- the corporates don't feel it.

The other real plus that we have found in all of our settings is to always find good support from your state utilities board. All of your state government boards and people are open to promote and advance you when they see a sincere effort being made. It's a two-way street. We need to keep legislators and regulators informed about what we are doing. If it has credibility, I've always found good support from government agencies and the REA, and our local state utilities board.

The big key is to go back with a renewed pledge to help focus and develop community unity, and to emphasize the strength that investments in telecommunications can add economically. One of the things that this has done for me personally is that as our community has grown, we have tourism in our town now. Some businesses have seen this as a nuisance, with busses unloading and loading on main street. Many of us in the beginning saw this development as a negative. But now, when I see someone drive up with an out-of-state license plate, I will go up to them and say "What can I do to help you?" Attitude is a key in how we promote ourselves.

Peter Korsching
Professor of Sociology
Iowa State University

We started planning this conference about a year ago and in some of the early planning that we did we were told that the topic we were addressing was very important for rural communities, but that having this workshop in February, 1997, was way too late, that communities were in desperate straits and needed this information now, and if you wait too long they will have moved beyond and what you are giving them won't be relevant.

I won't deny that changes have occurred since we started planning the conference, and that communities could have used the information much earlier, but what is really changing is not so much the rural communities but perhaps the technologies. Most rural communities are not any further along — except for a

few that are represented here — are not any further along than they would have been had we had this workshop back in the fall.

The real issue is that the problems and challenges and opportunities for communities are not tied up in the technologies. They are tied up in the people who live in those communities. Those are the real issues that we need to address. I could see this from the four community case studies that I was able to attend. The telemedicine presentation from Hays, Kansas, brought out the point that most doctors tended to be opposed or indifferent to the new telecommunications and telemedicine technologies. Really, to get this thing moving, it needs an enthusiast to get behind it, grab ahold of it, and move it on. The ACENet case study network in Ohio began with Amy telling us that this was not a story about technology, but about people in the communities that made things happen. The most important needs were training and technical assistance for the people so they were able to use the technologies. For the MTI Teleport system that was in Mitchell, S.D., the major issue addressed was that it needed a champion to get the whole thing moving. And then the cooperation and organization of other actors that were involved. And finally, the last session we just finished was on the Traversenet in Minnesota. Again, the thing that was mentioned there was the cooperation of all the actors that got involved and trust among those players. They trusted each other and they were willing to make commitments. So it's people kinds of issues, and not technologies, that seem to be driving things in these communities.

"The real issue is that the problems and challenges and opportunities for communities are not tied up in the technologies. They are tied up in the people who live in those communities."

The research that we've done in Iowa (Eric Abbott, Dom Caristi, G. Premkumar) and in Nebraska (Duane Olson, John Allen, Bruce Johnson) has shown that there are actually quite a few telecommunications technologies in use out there. The example of the druggist who is using a computer to check insurance company willingness to pay bills, to check interactions with other drugs the patient is using, and to access a database that prints warning information on drug containers, shows that new technologies are being used in various businesses and organizations. The technology, at least for many communities, is out there and is ready to use. The issue is more an issue of using the technologies than just their availability. The issue has to do with uses from which the whole community can benefit, not just a few businesses. What this requires then, and we can see this from the community case studies, is there is the necessity for some visionary leadership — some individual in the community or small group that has some insight in terms of what the technology is, what the potentials of that technology are, and can go ahead and take some action so that the community can get some benefit.

Now, in terms of the implementation of any kind of action within the community, we can begin to look at capital. There are various kinds of capital that are necessary. The one we most often think of first is **financial capital** -- money that is necessary to do whatever it is that we need to do. In addition to that, we also

have **technological capital** — in this case, the hardware and software necessary, the lines that come into the community, and all the other kinds of things that go along with that. We can use the financial capital to acquire the technological capital. Also, there is the **human capital** -- the expertise, the knowledge, and this visionary leadership, the skills that are necessary to do something with the technology. These are three types of capital that are very important to moving things along. A fourth type of capital, which is not often mentioned, is what I would call **social capital** -- the mutual trust, the cooperation and the organization that seems to be increasingly missing in communities as the best people -- the leaders, the young, those with the education -- leave the community. All four of the community case studies I attended mentioned this social capital -- the cooperation, collaboration, organization needed to get things done. What research has shown is that communities with high levels of social capital are the ones that are going to be able to get things done in a community. They are the ones that are going to be able to plan and implement projects.

"The issue, then, is how do we develop and enhance social capital in rural communities that are losing some of this very important social capital?"

The issue, then, is how do we develop and enhance social capital in rural communities that are losing some of this very important social capital? On the one hand, social capital can help enhance the use of telecommunications technologies. On the other hand, telecommunications can have an effect on social capital. Last night, Paul Yarbrough, in his presentation, talked about the debate that has been going on now for quite a while among sociologists with Roland Warren on one side — who argues that locality or place is still very important — and the other side that says "no," locality is no longer very important. They say the really important thing these days is a community of interest. In other words, the group that we share our interests with may not be living in the same place where we are living. For example, I have an interest in model railroading so I know people all over the United States who are also interested and I communicate with them. These include people I have met personally, people I have met on the Internet, etc. That is a community of interest. The issue is that telecommunications can create "virtual communities." I had a debate with a colleague of mine at Iowa State the other day who argued that place was no longer relevant -- it was community of interest that is now important. The Virtual Community has the potential for further eroding the community of place. Virtual communities create what have been called "communities of limited liability." In other words, they are communities of place, but the people who are living there really have little interest in the place itself because their social and psychological investments are not in that place. This can further erode the social capital of a community. There is another side to this -- a positive side. In the Ohio ACENet example, specific networks have been created within communities where people can obtain information about their communities very easily and have an impact on local decision-making. This is another area that needs attention to ensure that this community of limited liability does not increase, and that a higher level of social capital can be built up in our communities.

Alex Weego, Director
Todd County Development Corporation
Browerville, Minnesota

I'm the director of the Todd County Development Corporation, a 501C(4) non-profit made up of a board of directors of members of the community, business and government, and I'm funded by the cities, the towns, and the county. I'm basically funded by public money. You are now listening to the entire staff of the Todd County Development Corporation. It's a rather large county located just about equal distance between Fargo and the Twin Cities just north of the I-94 Interstate. The largest city in our county -- we have two of them — is approximately 2600 population and the smallest is about 97 population (we have about eight of them). We have a total county population of about 26,000. The area is highly agricultural -- about 90 percent of it is either given over to non-developed space or agriculture. There are a lot of small farms, and a lot of vacant small farms. Bertha, which is located up in the northwest corner of the county is considered the geographical center of the dairy industry in Minnesota. I've heard figures that nationally two small dairies a day close down in the country. That kind of gives you an idea of where we are. We are in the bottom 10 percent in per capita income and we are about twice the state unemployment rate.

When I moved there in 1994, I wanted to know where to go to plug into an Internet provider, and I was told I would have to go to St. Cloud, 70 miles away. Needless to say, economics did not allow that to occur. About a year and a half later, my local telephone provider (we have nine local telephone companies in our county -- the smallest serves a community of 350, and the largest is U.S. West) began providing Internet access. The county seat has just gotten local Internet access two months ago.

What I'm looking for and why I'm here is that my county organization is also a member of Rural Minnesota Partners and we work closely with the newly formed Office of Technology that has just been formed by the governor about six months ago. It's a concerted effort to bring all the technology levels and everything in the state of Minnesota under one hat.

My role is economic development. That's the standard thing -- looking for jobs, new types of businesses to come in and protect the businesses that we already have. To focus in on it more, there are two things that I have come up with as underlying driving forces. Number 1: Retain our young people or cause them to come back. Most of them want to, but it's just not there for them to come back and make a reasonable living.

Number 2: To provide a response to the latest welfare changes. We need to provide support for that because we do have a rather large welfare presence in our county because of the economic situation.

Concerning telecommunications, at this point we basically have nothing down in writing. There are a couple of plans that I have submitted to the Office of Technology for a Regional Technology Development Center. I have identified three things that we need to do in our county.

1. **Knowledge and Education**. More than 50 percent of the population in my county is over the age of 50. Most of them have still not learned how to program a VCR. It's just because of the state of technology and perhaps a fear of new things. I don't know how many of you can relate to this, but I remember the fear when I turned on my first computer that Peking would probably disappear. I found out that everything I did was self-inflicted.

2. **A plan**. Where do we go? What do we need to do? What are our resources? What are the demographics? Surveys. A lot of these have been answered by the excellent presentations I've heard here. Infrastructure. What do we really need? What's going to happen with satellites. I've had two local telcos tell me that they are very reluctant to invest in infrastructure because they are afraid that it may go to satellites and they will be left out there with all this infrastructure that really won't get used. So the questions of where the technology is really going and how to bring that together so that either that fear isn't there or they can see how to make satellites a participating partner are important. One of the things that we have been discussing with our legislators is perhaps a method for knocking down the time frame for depreciation -- maybe not make it so long for telcos. They all think that is a fantastic idea.

3. **Recognize Telecommunications as a Utility**. Along with water, sewer. Let them know that telecommunications is a utility as well as something that is nice to have.

The presentations I have heard so far have been a really tremendous help to me. I'm really looking forward to the process we will be going through in the next day.

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Number 2: To provide a response to the latest welfare changes. We need to provide support for that because we do have a rather large welfare presence in our county because of the economic situation."

Dominic Caristi
Assistant Professor
Department of Journalism and Mass Communication
Iowa State University

"What we need to do is collectively decide what role we want our governments, state and federal, to take on all of these issues We need to make that kind of decision rather than having it made for us. I'm still idealistic enough to believe that government wants to be responsive to the needs of people, and that if we can clearly articulate what we want in our communities, that legislatures at the state and federal levels will respond."

I am a policyaholic. I agree with Pete Korsching that the problems are not technological problems, but I disagree that they are all policy questions. Everything is a policy issue. I will talk about three in particular that I find recurring themes.

First are the public-private issues that Eric Abbott raised. You know the adage "Lead, follow, or get out of the way." I think that is the attitude that people have about government involvement in the whole situation. Interestingly enough, the same players who want the government to lead on one issue will want government to get out of the way on another issue. During the case study presentation by Kalona, Ray Marner made the statement about the fear that he has after investing $8 million in infrastructure that some day a competitive local exchange carrier will be able to come in and take away and cream skim from him his best business and make his $8 million investment go down the tubes. Yet, at the same time, some of that money for that infrastructure came from government-provided programs. That's not a negative statement. What I'm saying is the same players want to see government involvement in some ways and not in other ways. What we need to do is collectively decide what role we want our governments, state and federal, to take on all of these issues. We need to make that kind of decision rather than having it made for us. I'm still idealistic enough to believe that government wants to be responsive to the needs of people, and that if we can clearly articulate what we want in our communities, that legislatures at the state and federal levels will respond.

Governments choose to get into certain businesses and not others. We know what the history of the telephone network nationwide has been. The government, while it has been in the regulatory mode, has not owned the system as it has in so many other countries (or as it does with the road system here, where excise taxes have paid for a very nice Interstate system). The whole idea of what we want is the key. It may be nothing -- just get out of our way so we can do it. That's fine if that's what we want to tell them.

A second theme I hear recurring here is "universal" -- and the next word is kind of muddy. Some people use the term "access" and "service" interchangeably. I don't necessarily think that they are interchangeable. And again, I don't need to

review the history, but you all know that this was the great brainchild of AT&T to increase the value of its network. The whole idea of universal service was very self-serving for AT&T in 1912. The idea of what do we want to provide to whom -- are we talking about POTS (plain old telephone service to the homes), or are we talking about ISDN lines to individual homes, or are we talking about providing a network that has the capability to grow to this level? What do we mean when we use the terms "universal service" and "universal access?" Are we talking about providing a place for Internet access? Interestingly, when the NTIA opened discussions, they did them on the Internet as well as live and in person, and you could file comments electronically or by letter. They talked about providing these kinds of setups in communities, and there were different views about where this government-provided Internet link should be placed. People who saw it as a research service for connecting to other information sources said of course the link ought to be at the local library. Other people argued no, that it should be at the post office, because that's how they send mail to other people. I'm not suggesting it needs to be one or the other. I am suggesting that how we view universal service and universal access says a lot about the kinds of policies we want our governments to put into place.

My third point is simply the concept of competition. We operate under the assumption that competition lowers prices and increases choices. Ever since 1982, at least, since the MFJ, we have operated under that assumption for telephones. And in large part, that has been correct. What it has done is to eliminate cross-subsidy. People have seen that they now have to pay more for local phone service because once upon a time long distance subsidized it. We got cheaper long distance service, but there went the cross-subsidy. In terms of competition, there is more than one way to view competition. I mentioned the competition between local exchange carriers. The Nevada, Missouri, presentation talked about the idea of a collective being formed to bargain for a long distance carrier. Now, what about a rural community doing that with its residents? By law, they can't mandate; they can't go into a community and say "We're going to be the bargaining agent for all the telephone subscribers in our community." But is that something that would be valuable for a local community to be able to do that? To be able to bargain for every homeowner, for every business, for every school, for every government office in this community? We're doing it for local exchange, we're doing it for local access, for long distance networks, we're doing it for ISDN, or ATM, or whatever other services that community might need. The question comes back to you, and what I'll be waiting to hear is "What policies would you like to see in place that will make things work better in your community?" Be visionary. The possibilities are endless.

Thomas G. Tate
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USDA-CSREES
Washington, D.C.

I got this little assignment about 11 p.m. last night, and I thought, "what in the world could the federal perspective lend to the true value of what you all are doing pulling eight community success stories together?" To me, that is probably the most profound thing that's been done in this country thus far. I'm really tickled to be here at this meeting and be part of it. For each of us, think about it, we're going back to our own communities with new ideas of things that could be done in our communities. These are wonderful testimonials, and we've met the people who have implemented them, and that is extension work in its finest form -- finding out preferred management practices that have been successful elsewhere in the nation and taking them and customizing them to our local situations.

So my message going back home to the people tomorrow is that this was a very very successful meeting. Yet the more important piece is yet to come this afternoon and tomorrow when you build those back-home implementation plans. President Clinton and Vice President Gore have charged the nation to connect its schools to the network within the next five years. Health initiatives are critical -- the telemedicine example from Hays, Kansas, was vivid about the need as well as some of the solutions. The economic development opportunities, the engine for economic growth that information technology represents, are just terrific. Think about all of telecommuting that could take place if we get this infrastructure in place in our communities. Think of the millions of rural residents that will not have to drive to the Twin Cities or Kansas City or wherever they go and burn all that gasoline, be away from their families. We're looking at increasing the amount of parent-to-child time with the telecommunications capability in our country by millions of years of parenting time. It represents a tremendous social benefit to our communities.

Some of the benefits -- and I've talked about telecommuting, electronic commerce, opening up the goods and services that we produce in our regions to the international marketplace, putting up the electronic billboards to advertise the goods and services that are unique to our communities. In some of the community case studies yesterday I heard they are having people from Europe and Asia coming to some Mom and Pop businesses, bringing new money into rural America from international commerce and trade. Fabulous. Rural tourism destinations are now accessible to customers worldwide. Is that going to be in your back-home plan? Opening up world markets to your rural goods and services. Is that

going to be part of your back-home plan? Will you be attracting metropolitan employers to your rural communities? Will you be integrating the citizens of our communities into the mainstream of society and national commerce? I think it's next month that food stamps go down and ADC payments go down. There is an incredible threat to us as a nation as this welfare reform begins to kick in. What in the world are we going to do when people that are disadvantaged want to get some groceries for their families? I know what I'd do. If my children were hungry, I go do something, maybe even some bad things. I think it's realistic to expect that some of those things could happen.

What are we going to do? Does this information technology afford us access to some avenues for addressing welfare reform? Example: Federal outlays are coming down, there is more reliance on local communities and local governments to pick up those tasks. How can information technology help us do that? Non-profit organizations, non-government organizations are picking up a larger and larger role in welfare and tending to those who have distress. Are we going to provide the access and tools to those non-profit organizations so they can find the information assets they need to deal with the problems that someone has been throwing money at through all these decades. We contend that maybe the non-profit gateway that I mentioned briefly yesterday to you might be a beginning of that channel of communication.

"Does this information technology afford us access to some avenues for addressing welfare reform? Example: Federal outlays are coming down, there is more reliance on local communities and local governments to pick up those tasks. How can information technology help us do that?"

Health, improving access to medical care. We saw some excellent examples of that, linking rural hospitals and clinics to major medical centers, linking rural hospitals and clinics to experts at other locations, clinical interactive video consultation, nurse practitioners learning from the experts, distance training to rural health providers, management-transported patient information and linking medical facilities to medical expertise and library resources. These are all fabulous health benefits. Are they going to be in your back-home plans?

Potential government roles were commented on by Dom Caristi -- government should lead or get out of the way. I was reading my own personal plan of work -- here is what I said about rural telecommunications -- "work to assure that the land grant partners and other partners in rural America take advantage of the $2.25 billion universal service funds and other potential benefits of the Telecommunications Act of 1996." Are we getting to that at all in this meeting? Are we finding out what those potential benefits will be? The Fund for Rural America, the $2.8 million that USDA has identified for investments in rural telecommunications research -- I hope that those of you in this room that are going to make research and grant applications for that money will use it to help leverage the $2.5 billion out of the universal service fund. I see it as grubstake money for getting at the larger pot. How do we elevate these issues and concerns up on the radar screen of those 1,400 telcos in the United States that provide telecommunications. Are they sitting at our tables on our local planning teams?

Small Group Recommendations: Making Wise Choices For Rural Community Use of Telecommunication Technologies

What follows is a series of ideas emerging from small group discussions concerning activities that might help rural communities take advantage of new telecommunications technologies. Activities that might improve the ability of community developers, providers and regulators to better assist rural communities are also provided. The ideas are not organized or synthesized -- they represent the spontaneous ideas of individuals from communities, telecommunications providers, researchers, and policy makers. Although originally there were more than three small groups, ideas have been condensed here to three groups because of overall similarities between these three groups and the others.

Small Group No. 1

1. **Help Develop Communities of People** who can consider telecommunications opportunities. Important activities would include:

- Help people define what a "community" is in the telecommunications age. Help them see how telecommunications might be used to restore "civic life" to a community
- Help them understand what communities can do
- Help them identify what their particular community wants to do
- Begin with key players/stakeholders in the community, and keep it inclusive
- Develop community-level studies that show the roles of key sectors and the synergies that might be available from collaboration to use telecommunications technologies
- Help communities recognize that telecommunication is as much a "people" and "organizational" problem as it is a "technological" one

2. **Provide Information and Support Necessary for the Community to Decide Whether or Not It Wishes To Adopt Telecommunications Technologies**

as a Priority. This would include provision of sector studies, multiple models and paths, mapping resources available from private and public sectors, traditional and non-traditional sources; learning how to minimize diseconomies. Accept the fact that telecommunications may not be for everyone.

3. **If the Decision of the Community Is To Proceed, Assist in Development of Needed Mechanisms in the Following Areas:**

- Public access: via televillages, through libraries, or other mechanisms
- Training: for both individual and group needs
- Content: Such as GIS (geographical information systems) data and other data needed to map community assets
- Support: including the possibilities of local students gathering information and helping to provide support for new technologies
- Infrastructure: design of an open and inclusive infrastructure
- Provide multiple models of how communities might proceed, including who might start the process, who might be the champion, how trainers can receive training, multiple paths that can be taken, alternative mechanisms for networking. Alternatives would include proprietary networks owned and operated by the community itself, or a number of other forms that include partnerships between public and private providers.

"Provide Information and Support Necessary for the Community to Decide Whether or Not It Wishes To Adopt Telecommunications Technologies as a Priority... Accept the fact that telecommunications may not be for everyone."

4. **Assemble a "Networking Toolkit"** for communities, researchers, policymakers, providers and others that includes:

- Success stories: case studies, sector studies for libraries, schools, hospitals, businesses, etc. Also assemble stories of "failures" and near failures -- these can also be very useful.
- Marketing materials
- Training plans
- Technical expertise
- Business models
- Evaluation results/survey instruments
- Frequently asked questions
- Basic telecommunications terms
- Organizational development models/advice
- Financial resources

5. **Establish Networking Interactions That Enable Communities, Providers, Researchers, and Funders to Communicate With Each Other**

- "Just-in-time" consulting and evaluation assistance
- Contact information: Resource individuals provide information about their interests and experience in a searchable form
- Documentation center (with links to data and experts), perhaps similar to "Profnet," a current on-line service linking journalists with researchers. Also match community needs with researchers

- Catalytic funding -- link communities with donors or agencies that might provide start-up funding or other financial assistance

6. **Develop Networking Collaboration Among Those Interested in Telecommunications and Rural Community Development**
- Use links to search for and develop collaborative research and projects
- Create an Association for Community Networking and become members at a cost of perhaps $50 per year

Small Group No. 2

"Help explain the need for a telecommunications champion;

Help develop leadership and power brokers;

Develop networks in the community and outside the community."

1. **Provide Assistance for Communities in <u>Process</u>, <u>Action</u>, <u>Infrastructure</u>, and <u>Goals</u> for Taking Advantage of Telecommunications Technologies.**
- Process: Education and Awareness (by means of personal consulting, resource materials, newsletters, a catalog of resources, etc.)
    - Vision: help explain the need for a Telecommunications Champion
    - Vision: help develop leadership and power brokers
    - Develop networks in the community and outside the community
    - Develop community unity
- Action
    - Assist community strategic planning related to telecommunications: Model outcomes so that people can see what they will get as a result of various actions
    - Help conduct research to identify barriers to access
    - Provide internet training
    - Help conduct research concerning community needs and usage
    - Provide incentives for technology investment
    - Assist in creative financing for telecommunications projects, including linking communities to national and regional funding sources such as the "Fund for Rural America," Kellogg Foundation MIRA Project, etc.
- Infrastructure
    - Provide access points for those who can't afford hardware
    - Provide affordable equipment for end users
- Goals
    - Help communities devise plans that lead to affordable rates for telecommunications services
    - Work toward plans that lead to continued improved service for communities

2. **Help Develop Network Support Materials That Will Help Communities Develop and Guide Action Teams for Specifically Defined Projects**
- Tier One
    - Listserve materials that can be accessed and used by communities

    - Newsletters
    - Regularly scheduled annual meetings (on-site or distance)
- Tier Two
    - Video (on the basics of telecommunications)
- Tier Three
    - Bookmarks (for sharing information available on the World Wide Web
    - Telecommunications case study handbook (hard copy and CD)
    - Rural telecommunications leadership course
    - Success stories
    - Resource clearinghouse (hard copy and CD): "How to" videos, pamphlets, workshops, speakers, consultants, trainers, websites, grant writing team, etc.
- Tier Four
    - Establish partnerships with various public and private organizations
    - Develop an internet use training curriculum
    - Develop research on effectiveness of different models
    - Resource development (grant writing)

Small Group No. 3

1. **Use Rural Views and Comments to Impact Policy Decisions of the Federal Communications Commission and Other Telecommunication Regulatory Agencies**
- Gather rural views on specific needs (such as bandwidth)
- Ascertain rural community desired definition of "universal service"
- Provide rural community input concerning policy decisions affecting the cost of providing telecommunication services in rural communities, as well as consideration of who will be "left out."
- Recognize and review other comments by rural communities relevant to the policy process and make sure they are transmitted to the appropriate agencies

2. **Coordinate and Aggregate Research Relating to Telecommunications and Rural Community Development**
- Data gathering
- Guidelines/support for applied participatory research
- Wider sharing of existing plans, projects, and results (perhaps through such groups as RUPRI, NCR-90 Communication Research Committee, etc.)

3. **Encourage Partnering, Sharing and Collaborating**
- Inventory and share information about human and social capital development relating to telecommunications

"Provide rural community input concerning policy decisions affecting the cost of providing telecommunication services in rural communities, as well as consideration of who will be 'left out.'"

- Technology: Help communities become aware of new telecommunication technologies, and understand the process and training necessary to diffuse them in communities
- Application Models: Provide assistance and information to communities in an individualized form, using "just-in-time" techniques. Move beyond top-down methods.
- Recognize innovations peculiar to rural environments

4. **Encourage a "Buffalo Wallow" for Rural Communities that Helps Them Keep Pace with Changes in Telecommunications and Address Political, Economic and Technological Barriers**

- Periodic visioning: Think tank activities that help communities continually assess and revise their goals and activities
- Weekend Retreats: Activities to bring together individuals from across a region to assess what they are doing and how to take advantage of new opportunities

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Making Wise Choices

February 25-27, 1997
Kansas City, Missouri

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